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DISEASES CAUSED BY BACTERIA AND FUNGI.

SEDDON, H. R., & ROSE, A. L. (1934). **Control of Bovine Streptococcic Mastitis by Use of Autogenous Vaccine.**—*Aust. vet. J.* **10.** 3-10. [2 refs.]

This investigation on preventative vaccination against streptococcic mastitis was carried out in a dairy herd over a period of five years. At the commencement, all cows were inoculated with 20 c.c. of vaccine given in several doses and, subsequently, all introduced heifers were vaccinated prior to, or immediately after, calving. The whole herd was again vaccinated 18 months after the first vaccination. No unvaccinated controls were kept, the results being assessed by comparison with the incidence of the disease during the year previous to vaccination. During that year 28 per cent. of 90 cows contracted mastitis manifest to the farmer, whereas, of 65 heifers introduced during the investigation and observed for from two to five lactations, only 22 per cent. contracted manifest mastitis. 42 per cent. of the 24 cases of mastitis, occurring before vaccination, were severe ; after vaccination, 11 per cent. of cases of mastitis in cows originally in the herd were severe and, in the cows vaccinated as heifers, 26 per cent. of cases were severe. It is concluded that vaccination reduced the incidence of mastitis recognizable by the farmer. Bacteriological examinations indicated that the incidence of streptococcic infection of the udder was not altered. It is considered that the severity of cases of mastitis was diminished by vaccination and that recurrent attacks were fewer.

—W. I. B. BEVERIDGE.

STECK, W. (1934). Ein Verfahren für die Tilgung des gelben Galtes in verseuchten Beständen. [**A Scheme for the Control of Mastitis in Infected Herds**].—*Schweiz. Arch. Tierheilk.* **76.** 504-509. [2 refs.]

The author compared the efficacy of different acridine derivatives for the treatment of streptococcus mastitis. He found that " trypaflavine " possessed the maximum bactericidal action and was effective in destroying the causal organism in 75 per cent. of the treated quarters.—S. J. EDWARDS.

MILLER, W. T. (1934). **Studies on the Transmission of Bovine Mastitis.**—*Cornell Vet.* **24.** 230-244. 9 tables. [41 refs.]

Mastitis was produced in one or more quarters of each of three cows by injecting a suspension of *Streptococcus agalactiae*, in sterile lactose-saline solution,

into the teat canal with a blunt small gauge needle. Quantities of this culture of from 0·1 to 10 c.c. were used. In an animal that received the larger quantity of suspension, a prompt systemic reaction occurred, together with acute mastitis, but the streptococci disappeared in a day or two. A few days later the quarter was reinfected and a chronic mastitis developed. It was not possible, during an exposure period of several weeks, to transmit mastitis by means of a milking machine from infected animals to two healthy ones.—S. J. EDWARDS.

ROSELL, J. M. (1934). Quelques conclusions pratiques tirées de huit ans d'étude de la mammite en Europe et Amérique du Nord. [**Conclusions drawn from Eight Years' Study of Mastitis in Europe and North America**].—*Le Lait.* **14.** 914-924 and 1050-1060. [9 refs.]

In this general review, based chiefly on his own work and previous publications, Rosell states that 95 per cent. of bovine mastitis is of the chronic contagious kind caused by streptococci. According to his own figures and those of other workers, the degree of infection in individual herds may reach 80 per cent. or more, and averages about 30 per cent. Great loss is caused in all countries where milk is produced intensively. The following aspects are dealt with :– the nature of the disease, its diagnosis by physical, chemical and bacteriological methods, its control by the separation of infected and non-infected cows, and finally the question of vaccination.

His methods of diagnosis may be summarized as follows :– a test of the reaction of the milk with brom-thymol blue, a field modification of the catalase test and, in some cases, a field modification of the chloride test. These field tests are followed by a laboratory examination of samples from all normal or doubtful quarters.—A. W. STABLEFORTH.

HOLM, G. C. (1934). **The Types of Leucocytes in Market Milk as Related to Bovine Mastitis.**—*J. Amer. vet. med. Ass.* **85.** 735-746. 4 figs., 3 tables. [18 refs.]

This article describes a method for the detection of mastitis in market milk. Following a critical survey of the methods employed to determine the presence of mastitis in individual quarter samples, the author deprecates their use for market milk determinations as, since the majority of these tests are based on an increase of some milk constituent, the dilution of infected milk with normal alters the relationship to an extent which renders them valueless. A differential method of estimating the type and content of leucocytes in individual and mixed milk samples is described in some detail. From experimental evidence supplied, it would appear that this differential technique overcomes the difficulty of dilution and offers a reliable means of diagnosis for such examinations. In comparative experiments it apparently produces a higher proportion of successful results.—A. L. MULLEN.

WITTHOLZ, W., & LOCH, P. (1934). Ueber die Abtötung der Mastitis-Streptokokken. Ein Beitrag zur Bekämpfung der Mastitis-Seuche. [*In vitro* **Disinfection Trials with Mastitis Streptococci**].—*Z. Fleisch-u. Milchhyg.* **45.** 48-52. 3 tables. [11 refs.]

Wittholz and Loch have tested the bactericidal action of sodium thiocyanate in buffered solutions made up freshly or with a 5 per cent. solution of a stable proprietary preparation, " weidnerit ". In 0·5 per cent. concentration it killed *Staphylococcus aureus* in 30 seconds, and *Bact. coli*, *Streptococcus agalactiae*, and *Brucella abortus* in 15 seconds.

A table is given to show that it is more bactericidal than " trypaflavine,"

" rivanol ", phenol, or " entozon ". [The 0·5 " weidnerit " solution used has a pH of 2·04 and no evidence is given that its bactericidal action is not due to its acidity alone. This acidity would preclude its use in the treatment of streptococcal mastitis by injection *via* the teat canal].—A. W. STABLEFORTH.

FREUND, R. (1935). Contribution expérimentale à la question de la spécificité des streptocoques. [**The Specificity of Streptococci**].—*Ann. Inst. Pasteur.* **54.** 245-249. [7 refs.]

Freund concludes that the great importance of streptococci in a number of human diseases does not lie in a multiplicity of types with aetiological or organotropic specificity, but in their ubiquity, their great variability in virulence, and finally their property of causing secondary complications in most diseases.

—A. W. STABLEFORTH.

GRIFFITH, F. (1934). **The Serological Classification of** *Streptococcus pyogenes*.—*J. Hyg., Camb.* **34.** 542-584. 6 tables. [23 refs.]

Summarizing the results of the intensive study of haemolytic streptococci on which he made his first report in 1926 [*J. Hyg., Camb.* **25.** 385.], Griffith concludes from cultural and immunological evidence that the haemolytic streptococci associated with scarlet fever, tonsilitis and various septic conditions constitute a well-defined species, *Str. pyogenes*. He describes various cultural and serological aids to their identification, and lists a series of 27 serological types, showing that they have to some extent different pathological and epidemiological values.

The epidemiologically significant types appear to be about 20 in number, but it is believed that probably more than 30 type sera will be necessary for the complete analysis of the group. Twenty-seven individual types are defined. Some are classed as provisional types because they were unassociated with disease or obtained from isolated cases. The irregularities which have been observed in the agglutination reaction, on which classification was based, have been studied and are ascribed to variations in type specificity. Different colonies may give " type-specific " or " group " agglutination and these distinctions are revealed in the case of certain types by growth on serum agar containing about 2 per cent. of homologous agglutinating serum. The importance of using fully-equipped, actively pathogenic organisms, modified as little as possible by subcultures, for the preparation of type sera is emphasized. Examples are given of observations on the epidemiology of streptococcal infection in schools and other institutions.

The principles involved in the serological classification of a bacterial group are discussed.—A. W. STABLEFORTH.

I. RAUTMANN, H. (1934). Ein Beitrag zur Ausbreitung der Tuberkulose im Körper des Rindes auf Grund des Zerlegungsbefundes sowie der Ergebnisse der Milchserumkomplementbindung von 200 Kühen. II. Teil. [**Spread of Tuberculosis in the Bodies of Cattle Based on Collective** *Post-mortem* **Findings, also the Results of Milk Serum Complement-Fixation of 200 Cows. Part II**].—*Z. InfektKr. Haustiere.* **45.** 250-259. 3 tables. [1 ref.]

II. SCHUMANN, P., & FRITZSCHE, K. (1934). Beitrag zur Genese der Gebärmuttertuberkulose bei Rindern. [**Uterine Tuberculosis in the Cow**].—*Berl. tierärztl. Wschr.* **50.** 220-223. [8 refs.]

I. Of 200 cattle, whose milk gave a positive reaction to the complement-fixation test, 190 were found, *post mortem*, to be infected with tuberculosis in one organ or another. By far the most common seat of infection was the lungs, which showed lesions in 98 per cent. of cases. The frequency of infection in the other

organs was as follows :– pleura, 50 per cent., retropharyngeal glands, 35 per cent., liver, 32 per cent., peritoneum, 27 per cent. and kidneys, 14 per cent. With regard to methods of infection, the author states that the lung is infected by inhalation, although metastasis from a primary lesion in the abdominal cavity may occur. Dissemination of the disease usually takes place by the lymphatic system, but the blood stream usually conveys infection to the liver and kidneys. In 38 cases, where the disease involved the uterus, lesions were also found in the peritoneum in 26 cases, while in 12 cases no such lesions were found. Infection in the latter series is said to be conveyed to the uterus by the blood.

II. The usual conception of the origin of tuberculosis of the uterus is that it is due to descending infection from a fallopian tube which, in turn, is secondary to a pre-existing focus elsewhere in the body. The facts which are given in support of this method of infection are that uterine tuberculosis is nearly always associated with disease of the peritoneal cavity and frequently with lesions of the fallopian tubes.

The author carried out a *post-mortem* examination on 37 cattle with peritoneal tuberculosis, and found that there was disease of the uterus in 30 animals. A disseminated, miliary form of tuberculosis, in which the lesions were of millet seed size and confined to the deeper layer of the uterine mucosa, was found in 21 cases ; nine cases showed a nodular form in which the epithelium was sometimes extensively involved. Tuberculosis of the uterus was found in four animals which failed to show infection elsewhere in the body.

The authors state that direct haematogenous infection during the early stages of generalization may play as important a role in the causation of uterine tuberculosis as the descending method. He bases his conclusions on the following findings :– (a) the miliary form predominates ; (b) the lesions are confined to the deep layers of the uterine mucosa, and (c) the disease may be present without involving the fallopian tubes.—S. J. Edwards.

Hermansson, K. A. (1934). Primär juvertuberkulos hos ko som följd av infekterat mjölkrör. **[Tuberculosis of the Udder due to the Use of Infected Teat Tubes]**.—*Skand. VetTidskr.* **24.** 640-648. [English summary : abst. from orig.]

The author gives detailed descriptions of four cases of primary tuberculosis of the udder in cows, due to the use of an infected teat tube. The infection had been caused by an unqualified man when inflating the udder for milk fever. The same person had treated all four cases within a space of 21 days and had presumably used the same infected teat tube. Since two of the cases occurred in a herd free from reactors for the last 14 years, the author claims that it must be in the interest of the State to prevent repetition of similar incidents.—Gustav Naerland (Farsund).

Battaglini, U. (1935). Sur la virulence des ganglions mésentériques chez les bovidés atteints de tuberculose pulmonaire. **[The Virulence of the Mesenteric Lymph Nodes of Cattle with Pulmonary Tuberculosis]**.—*C. R. Soc. Biol. Paris.* **118.** 506-508.

Neither direct microscopic, cultural nor biological examination yielded evidence of infection of the mesenteric glands of 31 bovine subjects, affected by pulmonary tuberculosis alone. Infection of the bovine lymphatic system is commonly confined to the regional glands, so that partial seizure may safely be practised in carcasses presenting localized tuberculosis.—J. W. Emslie.

Bothe, E. (1934). Scheiden gesunde Drüsen bei tuberkulöser Erkrankung

anderer Organe Tuberkelbazillen mit den Se- oder Exkreten aus ? [**Possible Excretion of Tubercle Bacilli from Healthy Glands of Tuberculous Animals**]. —*Inaug. Diss. Berlin.* pp. 28. [37 refs.]

Bothe attempted to obtain evidence of excretion of tubercle bacilli in the urine of 18 guinea pigs, affected with tuberculosis of other organs, by injecting 0·75 to 2 c.c. of urine into another guinea pig. The result was negative in each case.—A. W. STABLEFORTH.

GRÄUB, E. (1934). Bundesratsbeschluss über die Bekämpfung der Rindertuberkulose. [**Swiss Parliament Decision about Bovine Tuberculosis Control**].—*Schweiz. Arch. Tierheilk.* **76.** 209-216.

The organization in each canton for the control of bovine tuberculosis is laid down. The definition of open and active cases of the disease is under consideration and includes, in addition to acute progressive cases, tuberculosis of the udder, sexual organs, lungs and alimentary canal. Farmers must report all cases or suspected cases of infection. After diagnosis based upon clinical and laboratory examinations, and if necessary upon the tuberculin test, infected animals must be slaughtered. The amount of compensation to be paid to the farmer is recorded, the manner in which the cost of compensation is to be met and the organization of the campaign is noted.—E. J. PULLINGER.

WÜNSCHER, H. G. (1935). Ueber das Vorkommen tuberkulöser Darmwandveränderungen beim Schweine. [**Intestinal Changes in Swine Tuberculosis**]. —*Z. Fleisch- u. Milchhyg.* **45.** 161-163. 2 figs. [5 refs.]

Microscopic changes occur in the pharyngeal lymphatic glands in cases of porcine tuberculosis, and are also found in infected intestinal glands. In 5 per cent. of such cases, microscopic evidence of tuberculous changes can be demonstrated. The incidence of primary tuberculous lesions in the intestinal tract in pigs is higher than it is possible to ascertain by macroscopic examination alone.—D. J. ANTHONY.

MCCARTER, Janet, BEACH, B. A., & HASTINGS, E. G. (1935). **The Relation of the Avian Tubercle Bacillus to Tuberculosis in Swine and incidentally in Cattle.** —*J. Amer. vet. med. Ass.* **86.** 168-175. 2 tables. [19 refs.]

The authors estimate that approximately one-third of the poultry flocks in Wisconsin are infected with tuberculosis and that the average incidence of the infection in flocks is about 10 per cent. They believe that the greater part of the tuberculosis in swine in the State is caused by avian tubercle bacilli.

They studied 41 cultures isolated from the lymphatic glands of pigs suspected of being infected with tuberculosis ; 40 of these cultures proved to be typical strains of avian tubercle bacilli. The remaining strain grew more rapidly than the average avian strain and was non-pathogenic for guinea pigs, rabbits and chickens. —T. M. DOYLE.

VALTIS, J., & VAN DEINSE, F. (1935). Transformation *in vitro* d'une souche bovine " dysgonique " en type " eugonique ". [**Transformation *in vitro* of Bovine Tubercle Bacilli from a Dysgonic to a Eugonic Type**].—*C. R. Soc. Biol. Paris.* **118.** 755-756. [3 refs.]

A bovine strain of the tubercle bacillus retained its dysgonic habit of growth for 14 months but, after subcultivation in Besredka's broth, showed eugonic behaviour on Löwenstein's medium. The eugonic character persisted on glycerinized potato and all ordinary media, whilst passage through a guinea pig yielded a strain which, on Löwenstein's medium, was both dysgonic and eugonic. —J. W. EMSLIE.

SERGENT, G. (1934). Recherches sur les formes filtrantes du virus tuberculeux. [**Filtrable Forms of** *Mycobact. tuberculosis*].—*Thesis for Docteur vétérinaire, Alfort.* pp. 214. 1 table. [320 refs.]

The first three parts of this work constitute a critical summary of available literature on the filtrable elements of tubercle bacilli, the form of tuberculous disease to which they give rise and their importance in diagnosis, prophylaxis, hygiene and similar matters.

Personal research concerned material obtained from bovine broncho-mediastinal glands and the urine of one dog, in both of which acid-fast bacilli were found by microscopy ; and ascitic, pleural and pericarditic fluids of canine origin, in none of which did microscopic examination reveal bacilli. Filtration was through Chamberland L_3 candles under pressure equivalent to 30 cm. of mercury, the time of filtration varying from five to 20 minutes. Guinea pigs were inoculated according to the method of van Deinse, that is, by the intraperitoneal route, two days after preliminary intraperitoneal inoculation with precipitated calcium phosphate. In all the 15 pigs so treated and killed two days after introduction of the filtrate, tubercle bacilli were demonstrated in stained preparations, principally from the mesenteric glands and peritoneal fluid. In no case were the bacilli numerous. The most frequent features at autopsy were white magmae on the parietal peritoneum and on the surfaces of the spleen and liver, but hypertrophy of the mesenteric glands and epiploitis, of varying degrees of severity, was also frequently encountered.—J. W. EMSLIE.

LOBEL, L. W. M. (1934). Lepra bubalorum. [**Lepra bubalorum – Nodular Skin Disease of Buffaloes**].—*Veeartsenijk. Mededeelingen, Dept. Econ. Zaken,* [72 refs.] [Also printed as *Thesis for Doctorate, Vet. Fac., Utrecht*]. [A summary appears in *Ned.-ind. Bl. Diergeneesk.* **46.** 290-310].

A detailed report on 21 cases of a nodular skin disease of buffaloes in the Dutch East Indies. Multiple nodules appear in the skin on various parts of the body, usually in the upper part of the limbs, but they may appear anywhere, including the nasal cavities.

The nodules are solid, sometimes lobulated, and measure 5 to 60 mm. in size. The largest may fluctuate and ulcerate, and may heal up. The condition is chronic and does not cause loss of health. On section, the nodules are yellowish-brown, enclosed by fibrous tissue, and contain fatty material which may show foci or necrosis or calcification.

The true situation of the nodules is the corium, but when ulceration appears, the epidermis is secondarily involved.

Microscopic sections show various kinds of cells, including granuloma cells, giant cells, fibroblasts and a few leucocytes.

Acid-fast bacteria and acid-fast granules, usually grouped into clumps of some size, are to be found in the fatty contents of the nodules. Attempts to cultivate the bacteria were not successful and inoculation tests on buffaloes, guinea pigs, fowls, mice and white rats also gave negative results.

Eight affected buffaloes were tested with bovine tuberculin by the ophthalmic method and three gave positive reactions, though all were negative to the subcutaneous test with bovine and avian tuberculin.

With regard to differential diagnosis, the condition has no connection with tuberculosis, Johne's disease, or the skin lesions of tuberculin-reacting cattle described in America. It has, however, much resemblance to nodular leprosy of man and the author suggests the name " lepra bubalorum " for this disease of buffaloes.—J. VAN DER HOEDEN (UTRECHT).

URBAIN, A., & GUILLOT, G. (1934). Infection expérimentale du Lapin par le Bacille de Preisz-Nocard (voies intracérébrale, intrarachidienne et oculaire). Sensibilité du Lapin à la toxine du Bacille de Preisz-Nocard. **[Experimental Infection of the Rabbit by the Preisz-Nocard Bacillus** – *Corynebact. pseudotuberculosis*].—*C. R. Soc. Biol. Paris.* **117.** 599-601.

Intracerebral inoculation of rabbits with a 24-hour-old culture of *C. pseudotuberculosis* was found to induce epileptiform convulsions, with the development of paraplegia and death in 48 hours ; death occurred in three days if this amount was inoculated intraspinally. When introduced into the conjunctival sac or intraocularly, local suppuration ensued. Also, a filtrate of a seven-day culture in Martin's broth was found to be very toxic when inoculated into rabbits by the above routes.—A. BROWNLEE.

GEDDERT, M. (1934). Geschichte der Schutzimpfung gegen den Rotlauf der Schweine mit besonderer Berücksichtigung der Simultanimpfung nach Lorenz. **[History of Swine Erysipelas Immunization].**—*Inaug. Diss. Berlin.* pp. 40. 1 table. [62 refs.]

Geddert's thesis is a historical study and as such should be consulted in the original to be appreciated. ARISTOTLE recognized the disease in his *Historia Animalium.* PASTEUR and THUILLIER first experimented with the infective agent in 1883. Various methods of vaccination culminated in LORENZ's work in 1891 to 1893. The early results and the gradual introduction of his method into the various Germanic states are passed in review. The latter part of the thesis is an extensive appreciation of LORENZ and his work.

The works listed as references include all those of importance in history, progress, and value of the serum-simultaneous method of LORENZ.

—A. W. N. PILLERS.

PHILIP, C. B. (1934). **Epizootic Tick-Borne Tularaemia in Sheep in Montana 1934.**—*J. Parasit.* **20.** 338.

An outbreak of disease in 1,320 yearling ewes, with 200 deaths, was associated with heavy infestation with *Dermacentor andersoni*, movement from winter to summer range, a coincident mortality in male rabbits and the occurrence of a human case of tick-borne tularaemia. *Pasteurella tularensis* was recovered from affected sheep and rabbits, and from infesting ticks on such animals. Strains of *P. tularensis* isolated from sheep and sheep ticks proved more virulent than those from rabbits. In view of the amount of tularaemia present, it was puzzling that the bacteria could not be isolated from unfed ticks, that the serum of all killed rodents gave negative agglutination tests, and that owners, employees and investigators escaped the disease.—U. F. RICHARDSON.

—. (1934). **The Pennsylvania Plan for the Prevention and Control of Bang's Disease (Bovine Infectious Abortion) Made December 1, 1921 – Revised in 1924, 1925, 1927, 1929 and 1934.**—*Pamphl. Penn. Dep. Agric.* pp. 4.

Bovine contagious abortion is a notifiable disease in the state of Pennsylvania.

This leaflet contains information for stockowners who wish to qualify for the certificate issued by the Pennsylvania Bureau of Animal Industry for abortion-free herds.—T. M. DOYLE.

PÉRÈS, G. (1934). Contribution à l'étude du diagnostic, de l'étiologie et de la prophylaxie de la mélitococcie. **[Some Observations on the Diagnosis and**

Control of Brucellosis in Animals].—*Rev. gén. Méd. vét.* **43.** 713-741. 1 fig., 2 tables, 2 graphs.

The author has studied naturally acquired brucellosis in goats and sheep, paying special attention to the diagnostic value of allergic tests and to immunization.

Two antigens are in current use for these tests, (1) the antigen of Dubois and Sollier consisting of a killed culture of *Br. abortus*, porcine strain, and (2) a sterile filtrate of *Br. melitensis* or of *Br. abortus*, i.e. melitin or abortin. Pérès employed abortin in his tests.

In sheep the tests are applied to the subcaudal fold, and in goats to the subcaudal fold or to the lower eyelid. The local reaction consists of a round or elongated oedematous swelling 1 to 3 cm. in thickness, which attains its maximum dimensions between the 36th and 50th hour. A thermal reaction of 1° to 3°C. occurs coincidently with the local reaction. Repeated tests on the same animal reduce both the local and thermal reactions.

These diagnostic methods are recommended only for the detection of the infection on farms and not for the infection in individual animals.

Pérès mentions that the vaccine prepared by Dubois and Sollier (1932), consisting of a live culture of *Br. abortus*, porcine strain, has been tested on 11,000 sheep and 1,000 goats with fairly good results. He employed a live culture of *Br. abortus* in his immunity experiments.

The author considers that immunization is of value in infected herds as it reduces the incidence of abortion and it is mainly when abortion occurs that human beings contract infection. He states that vaccination does not confer protection on healthy animals.

[This article should be read in the original by those interested as it contains much valuable information on natural brucella infection of goats and sheep].

—T. M. Doyle.

—. (1934). Abortuskommission der Gesellschaft Schweizer Tierärzte. [**Abortion Committee of the Society of Swiss Veterinarians : Recommendations**].—*Schweiz. Arch. Tierheilk.* **76.** 645-647.

Recommendations concerning eradication by the use of the agglutination test and segregation coupled with the usual hygienic precautions. The committee disapproves of the use of live vaccine except in special circumstances.

—E. J. Pullinger.

van Oijen, C. F., & Hofstra, H. (1934). Over Brucella Abortus-Bang infectie bij het rund. [**Bovine Contagious Abortion**].—*Tijdschr. Diergeneesk.* **61.** 394-410 and 470-487. 1 fig., 3 tables. [79 refs.] [English, French and German summaries : abst. from orig.]

Using agglutination tests with blood and milk serum, cattle infected with *Br. abortus* may be divided into three groups :– healthy or recovered animals without agglutinins, cows with positive reaction of the blood serum only and those with a distinct reaction of both blood and milk serum.

When combating contagious abortion on a farm, the second group must be separated from the first ; the last group, containing the carriers, must be eliminated from the farm.

Working with these three groups, the authors consider that it is possible to eradicate infection from the herds within a few years.

They consider that laws should be enforced on dairies to produce milk on a hygienic basis.—J. van der Hoeden (Utrecht).

BAUER, H. (1934). Beitrag zur Frage der Ausscheidung von Bangbazillen mit der Milch einer natürlich infizierten Kuh. [**Excretion of *Br. abortus* in the Milk of a Naturally Infected Cow**].—*Inaug. Diss. Munich.* pp. 59. 18 tables, 1 chart.

In a naturally occurring case of bovine contagious abortion, the whey agglutinin titre was at times as low as 1 : 5 and the serum titre as low as 1 : 100 although *Br. abortus* was being excreted in the milk. Such titres should, therefore, be considered as indicative of infection but the higher the serum or whey titre, the more likely was this organism to be found. *Br. abortus* was excreted by this cow for upwards of 16 weeks.—E. J. PULLINGER.

RANNEY, A. F. (1934). **The Elimination of Brucella abortus from the Faeces of Calves taking Infected Milk.**—*Cornell Vet.* **24.** 244-253. 1 table. [16 refs.]

Ten calves were used in this experiment to determine the length of the time during which *Br. abortus* is eliminated in the faeces of calves after the last feeding of infected milk. The organisms passed through the alimentary tract of all the calves and retained their virulence for guinea pigs. From 100 samples of faeces obtained while the calves were taking artificially infected milk, 40 were positive, 46 negative and 14 undetermined due to the deaths of the guinea pigs. *Br. abortus* was not found in the faeces of any calf seven days after the last feeding of infected milk. The agglutination test is not an accurate criterion by which to judge the length of time that a calf may continue to eliminate the organism after the feeding of infected milk is discontinued.—C. R. TURBET.

ZELLER, H., & BELLER, K. (1934). Infektionsversuche mit Brucellastämmen bei Rindern in verschiedenen Trächtigkeitsstadien. [**Infection Trials with *Br. abortus* in Cows in Various Stages of Gestation**].—*Münch. tierärztl. Wschr.* **85.** 1-5. 3 tables, 1 chart.

The experiments were carried out on 22 non-reacting cows or heifers, from abortion-free herds, or already at hand from other experiments unconnected with the genital system. The infection was carried out by injecting the bacteria from three to four day cultures on glycerin-agar slopes washed off into 2 c.c. of saline, the dose being 10 c.c. subcutaneously, followed by a further dose of 20 c.c. 14 days later. A mixture of six to 12 old and freshly isolated strains was used, ten animals receiving *Br. abortus* from bovine sources, five *Br. abortus* isolated from man and seven *Br. melitensis.* The inoculations were made four to thirty weeks after conception. *Br. abortus* from bovine sources caused abortion in most cases, *Br. abortus* from man in about half and *Br. melitensis* in none. On an average abortion occurred two to three months after inoculation. Brucella appeared in the blood not less than two to three weeks after inoculation and more frequently in the case of *Br. melitensis.* A temperature reaction generally followed infection.

Only six of the animals could be bred again, and these were reinfected at various stages of pregnancy. Of four which received *Br. abortus* of bovine origin, one aborted and one calved prematurely.

In the sterile animals, brucella were, apart from the udder, only found once in the liver and once in a mesenteric lymph gland, but never in the musculature.
—A. W. STABLEFORTH.

WITENSTEIN, F. (1934). Beitrag zur Aetiologie des spontanen Aborts. (Schwangerschaft und Bangsche Krankheit). [**Abortion in a Woman Due to *Br. abortus***].—*Zlb. ges. Gynäk. Geburtsh.* **58.** 1583-1588. [17 refs.]

Witenstein describes a case of abortion in a cook whose symptoms were those

of brucella infection and whose serum agglutinated *Br. abortus* to 1 : 400. Blood cultures or cultures from placenta were, however, not obtained and he notes that she had two previous abortions and another four months later.

—A. W. STABLEFORTH.

PÉRÈS, G. (1934). Une épidémie grave de Brucellose dans la Drôme. [**A Serious Outbreak of Undulant Fever in the Department of Drôme, France**].—*Bull. Soc. Sci. vét. Lyon.* **37.** 135-137.

Pérès reports an outbreak of undulant fever in which five persons were affected, three of whom, a man, a woman and a girl aged 13 years, died. A high percentage of abortions occurred in communal flocks of sheep and goats in the district.

Several nuns, in the hospital where four of the affected persons were treated, contracted the disease.—T. M. DOYLE.

MARTIN, & PÉRÈS, G. (1934). Un foyer important de fièvre ondulante à Valence. [**Undulant Fever at Valence, France**].—*Bull. Soc. Sci. vét. Lyon.* **37.** 130-135.

The authors record seven cases of undulant fever among men working on a farm ; one case ended fatally seven months after the onset of the infection. The women on the farm showed no clinical symptoms of the disease. Serological tests showed that the cattle, sheep and goats were infected with brucellosis. [At the time of publication the type or types of brucella infecting the different species had not been ascertained].—T. M. DOYLE.

VON BERKESSY, L., & SIMON, I. B. (1934). Neue Beiträge über das Vorkommen der Bangschen Infektion in Ungarn. [*Br. abortus* **in Human Beings in Hungary**].—*Wien. klin. Wschr.* **47.** 330-332.

The occurrence of undulant fever in a veterinarian and in a farm manager is described ; the former case was fatal.

Of sera from 63 persons in an agricultural district in which numerous bovine abortions had occurred, ten agglutinated *Br. abortus* at 1 : 200 to 1 : 600. Three had had symptoms which were possibly those of undulant fever. In another similar area all of 19 persons tested were negative.—A. W. STABLEFORTH.

LÉPINE, P., & PANGALOS, G. (1934). Recherches sur les brucelloses humaines en Grèce. [**Undulant Fever in Greece**].—*Bull. Soc. Path. exot.* **27.** 873-881. [8 refs.]

In a certain number of cases of undulant fever in Greece with which the authors were familiar, the source of the infection remained obscure. In one case there was some circumstantial evidence that the disease had been transmitted through the agency of food contaminated by flies.

They confirmed the value of the dye tolerance tests for the differentiation of the members of the brucella group. The dye tests were more reliable than the production of H_2S.

Twenty-four strains of brucella were isolated from human beings and all proved to be *Br. melitensis*. The intradermal test gave excellent results in known positive cases, but in some instances the possibility of false positive results could not be excluded.—T. M. DOYLE.

HUSTON, R. C., HUDDLESON, I. F., & HERSHEY, A. D. (1934). **The Chemical Separation of Some Cellular Constituents of the *Brucella* Group of Micro-**

Organisms.—*Bull. Mich. agric. Exp. Sta.* No. 137. pp. 25. 4 tables. [16 refs.]

Many authors have tried to correlate the chemical constitution of bacteria and the various phenomena of specificity exhibited by them. This paper deals with the separation and comparative study of the principal cellular constituents of the species *Brucella abortus*, *Br. suis* and *Br. melitensis*. The chemical methods are given in detail for fractionation into nucleo-protein, water-soluble albumin, albuminoids, polysaccharides, lipoids and an alcohol-soluble fraction. The species of the genus *Brucella* could be differentiated one from another by the relative proportions, rather than the kind, of two biologically inactive polysaccharides and two lipoid constituents. *Br. melitensis* was distinguished further from the other two species by the occurrence of a non-protein, non-polysaccharide, precipitating antigen, called the " S " substance, and not hitherto mentioned in the literature.

The biological properties of the nucleo-protein and water-soluble albumin fractions were very similar. Intradermal inoculation in brucella-sensitive human subjects of a 1 per cent. solution produced severe local and systemic reactions. Precipitation of antiserum was marked at 1 : 8,000 and visible at 1 : 12,800 dilutions of the antigen. Production of transitory agglutinins in low titre in the serum of guinea pigs was stimulated by large intraperitoneal injections. The albuminoid fraction was more active than the nucleo-protein fraction. Intraperitoneal injections of 25 mg. doses in normal guinea pigs caused a rapid fall in temperature, depression, coma and death in from six to 24 hours. The " S " substance of *Br. melitensis* in a 1 : 200 solution elicited non-specific skin reactions in either normal individuals or those sensitive to brucella. Amounts as large as 5 c.c. of a 1 per cent. solution, when injected intraperitoneally into normal guinea pigs, produced no toxic reactions or rise in temperature. Large successive doses failed to produce agglutinins or precipitins. Rapid precipitation with all brucella antisera occurred in dilution as high as 1 : 100,000 of the " S " substance. The polysaccharide and lipoid fractions were biologically inactive.—James Stewart.

Cerruti, C. G. (1934). Recherches sur l'identification de trente souches de " Brucelle " isolées en Sardaigne. [**Identification of 30 Strains of Brucella Isolated in Sardinia**].—*Boll. Sez. ital. Soc. int. Microbiol.* **6.** 399-407. 3 tables. [In French].

Cerruti studied 30 strains of brucella, of which 13 were isolated from human beings, 4 from sheep and 13 from goats. These strains were submitted to the customary identification tests, production of H_2S and dye tolerance tests. The dye tests, in the author's hands, gave rather discordant results. The 30 strains were finally classified as being 25 *Br. melitensis* and 5 *Br. paramelitensis*.

—T. M. Doyle.

Jadassohn, W., Riedmüller, L., & Schaaf, F. (1934). Die Unterscheidung nahe verwandter Mikroörganismer durch den Schultz-Daleschen Versuch. (Untersuchungen bei Brucella abortus Bang und Brucella melitensis Bruce). [**The Differentiation of Closely Related Micro-Organisms by the Schultz-Dale Reaction.** *Br. abortus* **and** *Br. melitensis*].—*Klin. Wschr.* **13.** 879-880. 2 figs., 1 table. [1 ref.]

An attempt has been made to differentiate closely allied organisms such as *Br. abortus* and *Br. melitensis* by an anaphylactic reaction. Antigen was prepared from broth cultures of the appropriate organisms, these being concentrated *in vacuo*, the growth being precipitated with alcohol which was then collected, washed and dried *in vacuo* over acid.

Guinea pigs were sensitized with subcutaneous inoculations of 10 c.c. of a 2 per cent. solution of dried organism. Animals were tested 47 to 52 days later for the Schultz-Dale reaction [i.e. contraction of unstriated muscle when in contact with the homologous antigen]. All sensitized animals reacted absolutely specifically, that is to say, guinea pigs previously inoculated with a bovine strain of *Br. abortus* were Schultz-Dale positive to bovine antigen, but not to antigen prepared from porcine or human strains. Those sensitized to porcine and to human strains showed similar absolute specificity.—E. J. PULLINGER.

FUKUTOME, I. (1934). **Infection of Nasal Membrane of Animals by Paratyphoid Group.**—[Abst. from English abst. in *Kitasato Arch.* **11.** No. 4. p. 6 of absts.]

The author carried out nasal infection tests with organisms of the paratyphoid group. *Salmonella cholerae-suis* (formerly *Bact. suipestifer*) was used for the experiments on rabbits and *S. typhi-murium* (formerly *Bact. aertrycke* or *Bact. enteritidis* Breslau) for those on mice. The results showed that a smaller quantity of the infecting organisms is required for infection by the nasal route than by the oral route. The organisms if introduced into the nasal cavity pass into the cervical lymphatic glands more quickly than if given by the oral route. It may therefore be assumed that animals are readily infected with these organisms *via* the nasal cavity.

VOGELSANG, T. M. (1934). **Paratyphoid B in Western Norway. Bacteriology, Symptomatology, Morbid Anatomy and Epidemiology of Infection with Bacillus paratyphosus B.**—*J. infect. Dis.* **55.** 276-298. 8 tables, 2 charts. [31 refs.]

One strain each of *Salmonella* (formerly *Bact.*) *abortus-equi* and *S.* (formerly *Bact.*) *abortus-ovis* was included in a cultural and serological investigation of 208 strains of *S. paratyphi* (formerly *Bact. paratyphosum*) B, ten strains of *S. typhi-murium* (formerly *Bact. aertrycke* or *Bact. enteritidis* Breslau) and strains of several related human pathogenic salmonella. Particular attention was paid to " slime wall " and mucoid growth that has been emphasized by several German workers as a means of differentiation between *S. paratyphi* B and *S. typhi-murium.* [" Slime wall " (" schleimwall ") refers to the ring of secondary colonies that develop around widely spaced colonies on agar plates during the 24 to 48 hours at room temperature after preliminary incubation at 37°C. for 24 hours]. *S. abortus-equi* is said to exhibit " slime wall."

The author is extremely doubtful if typical *S. paratyphi* B causes disease in animals and points to the steadily decreasing records in German literature of human infection by animal paratyphoid bacteria. In his epidemiological investigations of human paratyphoid, carried out recently in western Norway, he received from public health officers only one report on simultaneous disease of animals and that merely to the finding of many dead lemmings. [No information is given concerning the cause of death in the lemmings. Deaths in lemmings due to tularaemia ? have been reported – see this *Bull.* **1.** 274].—J. W. EMSLIE.

I. TRUCHE, C., STAUB, A., & BAUCHE, J. (1934). Différenciation du *B. pullorum* et du *B. gallinarum.* [**The Differentiation of** *Salmonella pullorum* **and** *S. gallinarum*].—*Bull. Acad. vét. Fr.* **7.** 268-271. [2 refs.]

II. LESBOUYRIES, G. (1934). Différenciation entre *B. pullorum* and *B. gallinarum*. [**The Differentiation of** *S. pullorum* **and** *S. gallinarum*].—*Ibid.* 272-273.

I. It is stated that birds affected with *S.* (formerly *Bact.*) *pullorum* infection

do not respond to treatment, whereas poultry affected with fowl typhoid may be treated by the ingestion of anti-typhoid vaccine.

Details are given of the preparation of two media, with colour indicators by means of which it is possible to differentiate between *S. pullorum* and *S. gallinarum* (formerly *Bact. sanguinarium*).

II. Details are given of the appearance of the growth of *S. pullorum* and *S. gallinarum* on first cultivation on Martin's agar for 24 hours at 39° to 40°C.

A definite diagnosis can be made by means of the sugar reactions. [This has previously been shown by many other workers]. *S. gallinarum* ferments maltose in 24 hours, but with *S. pullorum* this sugar shows no reaction after several days.
—NORMAN DOBSON.

MOORE, J. M., MALLMANN, W. L., & ARNOLD, L. R. (1934). **Studies on Pullorum Disease. I. The Influence of Different Temperatures in Brooding.**—*J. Amer. vet. med. Ass.* **84.** 526-536. 7 figs., 5 tables. [3 refs.]

The experiments were planned to determine the influence of various factors on the incidence of *Salmonella* (formerly *Bact.*) *pullorum* infection in chicks during brooding. A study was made of the influence of brooding temperatures upon (1) infected chicks ; (2) non-infected chicks, and (3) non-infected chicks that have been exposed to the disease by contact with infected stock.

Chicks hatched from reactor hens and brooded at varying temperatures for the first week had a much higher mortality than chicks hatched from tested hens and brooded under similar conditions.

When the temperature in the brooder was lowered, chicks from tested stock did not show such an increase in mortality as the chicks from reactor stock.

Chicks hatched from non-reactor hens, when housed with chicks from reactor hens in a brooder, showed a higher mortality than when they were brooded by themselves.

Chicks hatched from non-reactor hens have a much better chance of living under indifferent conditions, such as incorrect temperature in transit, or poor management after reaching the new owner, than have those hatched from infected stock.—NORMAN DOBSON.

HUDSON, J. R. (1934). **Fowl Typhoid in Kenya Colony.**—*Vet. J.* **90.** 344-355. 5 tables. [15 refs.]

A summary of *post-mortem* examinations made on poultry at Kabete Laboratory during 1931 to 1932 shows that fowl typhoid is the most important disease of poultry in Kenya. The disease usually occurs in fowls and turkeys and there is no marked seasonal incidence. No cases of mortality in chicks during outbreaks in older birds have been encountered, and the author has never isolated the organism of fowl typhoid from chicks. The epizootiology of fowl typhoid and *Salmonella* (formerly *Bact.*) *pullorum* infection in Kenya shows that the two diseases are quite distinct.

The aetiology, symptoms, pathology, and diagnosis of the two conditions are described in detail. It appears from experiments that the agglutination test is not of value in the detection of birds suffering from fowl typhoid, in the detection of carriers, or in assessing immunity. Vaccination with live cultures attenuated by subculture has given good results, provided that the birds are not exposed to a very heavy infection.—R. F. GORDON.

TAKITA, J. (1934). **On the Significance of the Nasal Cavity on the Lethal Tests**

with Hog Cholera and Mouse Typhoid Organisms.—[Abst. from English abst. in *Kitasato Arch.* **11.** No. 4. p. 6 of absts.]

The death of an animal may be caused by injection or oral administration of *Salmonella cholerae-suis* (formerly *Bact. suipestifer*) but the dose given *per os* must be larger than that administered as an injection. In order to find the reason for this difference, the author gave various quantities *per os* and *via* the nose and attempted to find the fate of the organisms in various parts of the gastro-intestinal tract. It was found that when the organisms were given *via* the nose they remained there, and also in the intestine, longer than they remained in the mouth when given *per os*.

POENARU, D. J. (1934). Le pléomorphisme de *Microsporum equinum*. [**Pleomorphism of** *Microsporon equinum*].—*C. R. Soc. Biol. Paris.* **117.** 1132-1133. 3 figs.

A strain of *M. equinum* grew on glucose agar in the form of smooth disc-like colonies. After the organism had been subcultivated a hundred times on maltose media, white downy colonies were obtained, and this feature appeared regularly, no matter how often subcultivations were made.

The author thus confirmed SABOURAUD's view that it is at present impossible to get a pleomorphic culture to revert to its original form.

—GWILYM O. DAVIES.

STEYN, D. G. (1933). **Fungi in Relation to Health in Man and Animal.**—*Onderstepoort J. vet. Sci.* **1.** 183-212. 1 table. [69 refs.]

This paper principally concerns poisonous symbiotic and parasitic fungi attacking foodstuffs, and includes those containing the poison within themselves, for example, ergot, and those producing harmful substances in the foodstuffs on which they grow.

It commences with a historical survey of records of fungus-infected foodstuffs, followed by a consideration of the toxic constituents of fungi and infected foodstuffs, and immunity to such poisoning, both natural and acquired.

Details are then presented, in tabular form, of experiments conducted to determine the harmful effects of fungus-infected foodstuffs. These do not lend themselves to abstraction and the original should be consulted by those interested.

According to the author, all fungus-infected foodstuffs should be considered poisonous until extensive feeding experiments have shown the contrary to be the case. Some cases of suspected food poisoning appear to be either botulism or parabotulism. So-called "fresh hay poisoning" is still a mystery. Different animals display marked differences in susceptibility to fungus-infected foodstuffs. Regarding harmful mouldy foodstuffs, it is stated that it could be fed to some animals with impunity, provided that the quantity fed did not exceed 10 per cent. of the total ration.

The toxicity of *Lolium temulentum* (darnel) to man and animals is due to an alkaloid, temulin, present in grain attacked by *Endoconidium temulentum*. Two rabbits, a pig and a dog fed on fungus-infected darnel suffered no ill effects.

—GWILYM O. DAVIES.

NOBINDRO, U. (1934). **Grass Poisoning [actually Fungous Infection] among Cattle and Goats in Assam.**—*Indian vet. J.* **10.** 235-236.

The title of this paper is somewhat misleading as the cause of the poisoning is attributed to the infestation of the grass with a fungus closely related to *Claviceps purpurea* and identified as a *Balansia* sp., and not to the grass itself. The symptoms

observed were similar to those of ergotism : treatment and pathological findings are described. In the early stages of the disease the animals were successfully treated by an enema of soap and warm water, followed by an oleaginous laxative and, after defaecation, well diluted liquor trinitrini. This treatment failed, however, in the more advanced stages of the disease.—G. D. SHEARER.

DISEASES CAUSED BY PROTOZOAN PARASITES.

SINTON, J. A., & SHORTT, H. E. (1934). **Cutaneous Leishmaniasis as a Natural Infection of a Dog in India.**—*Indian J. med. Res.* **22.** 393-396. [4 refs.]

This is only the third case of natural canine leishmaniasis reported from India. The case was encountered at Kasauli in the Himalayas, but the authors consider that the infection was probably contracted during a visit to the Punjab where *Phlebotomus papatasii* and *P. sergenti* exist, and where human cutaneous leishmaniasis occurs. The disease was evidenced by nodules which occurred on the hairless skin just outside the sensory area of the nose. These nodules were about 3 mm. in diameter and might easily have been overlooked except for their light colour showing against the black skin.—U. F. RICHARDSON.

VAN SACEGHEM, R. (1934). Sur le diagnostic des infections dues à *Trypanosoma vivax* chez les bovidés. [**The Diagnosis of** *Tryp. vivax* **Infections in Cattle**].—*Bull. Soc. Path. exot.* **27.** 733-734. [2 refs.]

The author considers that, for the detection of *T. vivax* infection in cattle, the examination of lymphatic gland juice is more reliable than the examination of blood.—U. F. RICHARDSON.

BOURGUIGNON, G. C., & JUSSIANT, A. (1934). Notes sur une épidémie de trypanosomiase porcine observée au Katanga. [**An Outbreak of Porcine Trypanosomiasis at Katanga**].—*Ann. Soc. belge. Méd. trop.* **14.** 393-399. 1 table. [5 refs.]

An investigation into an outbreak of trypanosomiasis in pigs revealed a small trypanosome of the *congolense* type which was not inoculable into the guinea pig. The organisms exhibited some evidence of polymorphism, some resembling *T. rodhaini* and others *T. congolense* ; globular and latent forms occurred in the auricular blood, but forms resembling *T. simiae* predominated. The authors consider that the outbreak was due to a pure infection with *T. simiae* which may exhibit polymorphism. A high rate of mortality was recorded amongst infected pigs, but four pigs found infected in December were still alive at the end of February, although they had revealed a very high blood infection at every examination. *Glossina morsitans* was the most prevalent tsetse fly of the district, though *G. brevipalpis* also occurred. A neighbouring herd of cattle was infected with *T. vivax*.—U. F. RICHARDSON.

CORSON, J. F. (1934). **The Infectivity of** *Trypanosoma rhodesiense* **in Relapses after Treatment with " Bayer 205 ".**—*Ann. trop. Med. Parasit.* **28.** 225-226. [3 refs.]

The author records experiments carried out on rats to ascertain whether the trypanosomes appearing after a relapse to " Bayer 205 " treatment are infective.

Three infected rats treated with 1 c.c. of a 0·2 per cent. solution of " Bayer 205 " exhibited a recurrence of peripheral trypanosomiasis five days after treatment, and the trypanosomes proved infective to other rats by inoculation and to a guinea pig by transmission through *Glossina morsitans*.—U. F. RICHARDSON.

LAUNOY, L. (1934). A propos de la communication de MM. Velu et Zottner sur la prévention de la dourine chez le baudet marocain. **[On the Article by Velu and Zottner on the Prevention of Dourine in the Moroccan Donkey].** —*Bull. Soc. Path. exot.* **27.** 322-323. [2 refs.]

The author points out that the dose of " 309 Fourneau " required to protect a mouse against *Tryp. brucei* has little bearing on the dose required to protect a donkey against *T. equiperdum* ; that when large differences of weight are involved the appropriate dose is governed largely by surfaces and, when a different species of animal is concerned, the dose appropriate to that species must be determined by experiment.—U. F. RICHARDSON.

LAUNOY, L. (1934). Maladie inapparente à *Trypanosoma annamense* chez le chat. [*Tryp. annamense* (*evansi*) **Infection in the Cat with No Symptoms**].—*Bull. Soc. Path. exot.* **27.** 848-850. [3 refs.]

This article records observations on a cat which was infected with *T. evansi* for two years without exhibiting any symptoms of disease. Trypanosomes could be detected in the blood during 1933, but in 1934 no trypanosomes were seen on the rare occasions when microscopic examination was undertaken. Samples of heart blood taken in May and September 1934, conveyed a fatal infection when inoculated into other cats. Attention is also drawn to the record of a rabbit, inoculated with *T. congolense* in January, 1934 ; its blood was infective in October, 1934, though microscopic examination had failed to detect any trypanosome infection.—U. F. RICHARDSON.

DUKE, H. L. (1934). **On the Employment of Volunteers in Trypanosomiasis Research ; and on the Element of Control in Experiments with Trypanosomes and Glossinae.**—*Parasitology.* **26.** 315-324. [8 refs.]

The first part of this paper deals with certain aspects of the use of human volunteers in trypanosomiasis research, and more particularly with the possibility of cryptic infection with *T. rhodesiense*. This form of infection has not been encountered, but the author points out that every volunteer who escapes infection should be ultimately proved to be susceptible.

The second part of the paper emphasizes the importance of controls in trypanosome experiments, and deplores the lack of evidence on this point given in most reports. The infection of a control reedbuck with a polymorphic strain of trypanosome is recorded, and certain evidence is produced that this was an infection with *T. rhodesiense*, contracted from a companion reedbuck and transmitted by *Stomoxys*. [This assumption is, of course, open to doubt].—U. F. RICHARDSON.

VILLELA, E., & DIAS, E. (1934). Localisation des formes de multiplication du *Schizotrypanum cruzi* dans la peau et dans les muqueuses de chiens expérimentalement infectés. Parasitisme de la cellule épithéliale de l'épiderme. **[The Epithelial Predilection of *Trypanosoma cruzi* in Experimental Infection of Dogs].**—*C. R. Soc. Biol. Paris.* **117.** 501-504. 3 figs. [6 refs.]

Attention is drawn to the invasion of the epithelial cells of the skin by *T. cruzi* in experimental infections of dogs with a strain of the organism from Tatou, Brazil. The parasites could be detected in the epithelial cells of the malpighian layer and other outer layers of the skin including the horny layer, and in the cells of Langerhans and other cells of epithelial origin. Attention is also drawn to the presence of the parasites in the submucous layer of the gastro-intestinal tract of dogs exhibiting a cutaneous infection.—U. F. RICHARDSON.

REICHENOW, E. (1934). Beiträge zur Kenntnis der Chagaskrankheit. [**Contribution to the Study of Chagas' Disease**].—*Arch. Schiffs- u. Tropenhyg.* **38.** 459-477 and 499-518. 5 figs., 1 table, 1 map. [38 refs.]

This article records a study of Chagas' disease in Guatemala. 35 per cent. of *Triatoma dimidiata* were found to contain flagellates, but human infection appeared to be uncommon. Of 94 dogs examined, 3 per cent. were infected and in young animals the infection rate was 25 per cent. The author suggests that probably most young dogs in the country contract infection. A dog, infected experimentally, recovered and proved immune to other strains of the parasite on subsequent inoculation. Two of the infected dogs died, but their deaths were probably due to other causes. Inoculated guinea pigs recovered, but were susceptible to reinoculation. The organism caused a fatal infection in mice, but rats were entirely resistant to most strains.—U. F. RICHARDSON.

DIAS, E. (1935). Le xénodiagnostic appliqué à la trypanosomiase américaine. [**The Transmitter Test for the Diagnosis of American Trypanosomiasis – Chagas' Disease**].—*C. R. Soc. Biol. Paris.* **118.** 287-289. [1 ref.]

By feeding specimens of *Triatoma megista*, raised in the laboratory, on 38 persons suspected of Chagas' disease, two individuals were found to be infected, as the bugs fed on them developed a *Tryp, cruzi* infection. Fresh blood smears and thick blood films prepared from these persons had failed to reveal infection. —U. F. RICHARDSON.

ROMANA, C. (1934). Investigaciones sobre la enfermedad de Chagas. I – III. [**Investigations on Chagas' Disease. I – III**].—*Univ. Buenos Aires Mis. Estud. Patol. reg. Argentina Jujuy.* No. 14. pp. 45. 19 figs. [6 refs.] [Abst. from abst. in *Rev. appl. Ent.* **22.** 81].

The third part of this paper records the finding of *Trypanosoma cruzi* in dogs in the Santa Fé and Chaco Territory, Argentina.—J. E.

SCHWETZ, J. (1935). Présence de Theileria dans le sang des antilopes du genre Cephalophus de la forêt équatoriale africaine. [*Theileria* **Infection of the Blood of Forest Antelopes of Equatorial Africa**].—*Ann. Parasit. hum. comp.* **13.** 32-35. 1 fig., 1 table. [4 refs.]

The author records the detection of species of *Theileria* in blood smears from five species of *Cephalophus* [duiker] from the Congo forests. The parasites were rare except in one species, *C. melanorheus aequatoralis*, in which they were more numerous and were associated with a condition of anaemia. No search was made for blue bodies, but on morphological grounds the author thinks that the parasites belonged to the *Th. mutans* group.—U. F. RICHARDSON.

TAYLOR, E. L. (1935). **An Attempt to transmit Anaplasmosis by British Biting Flies.**—*Vet. J.* **91.** 4-11. 2 tables. [1 ref.]

Efforts were made to transmit anaplasmosis from infected to susceptible uninfected bovines through the medium of the biting flies *Haematopota pluvialis* and *Stomoxys calcitrans*. Single specimens of *H. pluvialis* were used, but *S. calcitrans*, which was obtainable in large numbers, was handled in batches ranging up to 300. After feeding on the infected animals the flies were immediately removed to the uninfected animals and allowed to feed on these. Transference of the disease was not effected, however, although one susceptible animal received 46 bites of *H. pluvialis* and another received over 6,000 bites of *S. calcitrans* which had fed immediately before on an infected animal at the height of its reaction.

It was concluded that the transmission of anaplasmosis through the agency of biting flies is unlikely to take place under natural conditions in Great Britain.

—E. L. TAYLOR.

LIWOTOW, N. A. (1933). K woprossu ob ismenenii krowi pri anaplasmose krupnogo rogatogo skota. [**The Blood Picture in Bovine Anaplasmosis**].—*Arb. Mittelasia. Forsch.-inst. wiss. Vet.* **1.** 22-28. [Abst. from abst. in *Tierärztl. Rdsch.* **40.** 895].

The principal blood alterations which were found to occur in bovine anaplasmosis were a lowering of the haemoglobin content and the erythrocyte counts, which did not return to normal till a long time after recovery, and a leucocytosis. The granulocytes showed a displacement of the nucleus which had a coarser formation than that of normal cells ; the azurophile granules of the premyelocytes sometimes remain through the myelocyte stage, and only disappear in the metamyelocytes [immature polymorphonuclear forms]. The eosinophiles disappear at the beginning of the disease and only reappear some time after recovery.

—U. F. RICHARDSON.

MANWELL, R. D. (1934). **How Many Species of Avian Malaria Parasites are There ?**—*J. Parasit.* **20.** 334.

The author discusses the validity of the various species of avian malaria parasites, and describes a new species, *Plasmodium polare*, from a cliff swallow of Syracuse. The organism is characterized by elongate gametes and by the fact that not more than 16 merozoites are produced per segmenter, that the nucleus of the host cell is not displaced and that the larger asexual forms always occupy a polar position in the erythrocyte.—U. F. RICHARDSON.

HERRICK, C. A. (1934). **The Development of Resistance to the Protozoan Parasite,** *Eimeria tenella*, **by the Chicken.**—*J. Parasit.* **20.** 329-330.

Comparable numbers of oocysts of the parasite *E. tenella* were administered to chickens of ten different ages varying from three to 450 days. Chickens 90 days or older were more resistant to infection than were younger chickens, but the younger groups apparently developed resistance following infection as readily as did the older groups. The first generation of chickens raised from resistant parents were approximately 100 per cent. more resistant to infection with coccidia than were chickens from unselected parents.—U. F. RICHARDSON.

SCHWETZ, J. (1934). Recherches sur les Grahamella, Bartonella et Eperythrozoon des rats et des souris sauvages de Stanleyville (Congo Belge). (Deuxième étude). [*Grahamella, Bartonella* **and** *Eperythrozoon* **of Wild Rats and Mice of Stanleyville (Belgian Congo)**].—*Ann. Parasit. hum. comp.* **12.** 528-542. 6 figs. on 1 plate, 2 tables. [9 refs.]

Bartonella infection was detected in rare instances in normal rodents, but, on splenectomy, it was found that a large proportion of the 81 animals under examination were infected. The appearance of bartonella infection was associated with a severe anaemia which commonly resulted in death. In some cases severe anaemia was exhibited after splenectomy without the appearance of bartonella. The organisms appeared in from two to 56 days after the removal of the spleen, the usual period being four to five days. One case of pure infection with eperythrozoon was encountered ; in other cases it complicated bartonella infections. Splenectomy did not appear to influence grahamella infection. Bartonella were transmitted by inoculation from rat to rat and from mouse to rat.—U. F. RICHARDSON.

RHOADS, C. P., & MILLER, D. K. (1935). **The Association of Bartonella Bodies with Induced Anemia in the Dog.**—*J. exp. Med.* **61.** 139-148. 1 fig. on 1 plate, 3 tables, 1 chart. [13 refs.]

When splenectomized dogs were fed on a blacktongue-producing diet the authors found that a slowly progressive anaemia developed, accompanied by the presence of bartonella-like bodies either in or on the erythrocytes or free in the plasma. If the dogs were than fed on lean meat, a recognized prophylactic against blacktongue, recovery took place accompanied by the disappearance of these bodies. The condition was reproduced by injecting blood containing these bodies into other splenectomized dogs fed on either a good or deficient diet, but not into non-splenectomized dogs. Injections into normally fed healthy dogs did not produce anaemia.

The authors conclude that two factors control the production of anaemia, splenectomy and a deficient diet. Neither alone will give rise to the conditions.
—GWILYM O. DAVIES.

BROWN, H. C. (1933). **Further Observations on the Electric Charge of the Erythrocytes in Certain Protozoal Diseases.**—*Brit. J. exp. Path.* **14.** 413-421. 1 fig. [24 refs.]

Previous work had revealed that a reduction occurred in the electric charge of the erythrocytes of canaries that had recovered from avian malaria, and those of rats cured of *Tryp. equiperdum* infection by treatment with " Bayer 205 ". The present paper records evidence that this reduction of charge is due to the action of the serum on the corpuscles, since a similar reduction occurs in the charge of the corpuscles of a normal animal under the influence of the serum of a recovered canary or rat.

On investigating the action of the protein fractions of equine blood, it appeared that an excess of euglobulin was capable of producing a reduction in the charge of the erythrocytes. The author suggests that the rationale of the treatment of human general paralysis by the inoculation of malaria might be due to phagocytosis of the spirochaete, induced by an increased euglobulin content of the serum of the patient, caused by the malarial infection.—U. F. RICHARDSON.

DISEASES CAUSED BY VIRUSES.

FRENKEL, H. S. (1934). Over virus-onderzoek. [**Research Work on Viruses. A Review**].—*Tijdschr. Diergeneesk.* **61.** 1081-1094 and 1140-1153.

This is a survey of modern conceptions of viruses and diseases caused by viruses, with special reference to the significance of the use of tissue culture in experimental studies of viruses.—J. VAN DER HOEDEN (UTRECHT).

ROBBINS, W. J. (1934). **Isolation of the Infective Principle of Virus Diseases.**—*Science.* **80.** 275-276. 1 table. [6 refs.]

Ever since it has been propounded that the causative agent of some virus diseases might be of a non-living character, many research workers have theorized concerning their isolation and chemical characteristics. Much has already been done in the concentration of the infective principle of certain virus diseases, especially that of tobacco mosaic. In the present communication, the author has attempted to show the tremendous task in front of anyone trying to isolate even a grain of the principle. He has calculated that, even with 100 per cent. yield, it would be necessary to extract 606,000,000 litres of juice in order to obtain 0·1 g.

of infective principle. He bases his calculation on the assumption that the molecular weight of the infective principle would be approximately 100,000 and the number of infective particles per c.c. of juice would be 1,000,000, but for neither of these assumptions, however, does he produce much convincing proof. Nevertheless, despite the highly speculative nature of the figures given, it is obvious that the task of isolating the active principle of a virus disease would necessitate vast quantities of material before a significant yield could be obtained.—JAMES STEWART.

GERLACH, F. (1933). Ergebnisse einer Nachprüfung der Rinderpest-Trockenvakzine nach Süreyya Tahssin. [**A Test of Süreyya Tahssin's Dry Rinderpest Vaccine**].—*Wien. tierärztl. Mschr.* **20.** 326-348. 6 figs., 1 table, 5 charts. [37 refs.]

This article reviews the various methods of conferring immunity against rinderpest and records a test of Tahssin's powder vaccine. This vaccine is prepared by cutting up the kidneys, heart muscle, spleen and lymph glands of an animal infected with rinderpest, and triturating 1 kg. of the organ pulp with 1 litre of normal saline to which has been added 3 per cent. of formol. The mixture is allowed to stand at room temperature for 24 hours and the formol is then neutralized with ammonia and any free hydrochloric acid neutralized with soda. The supernatant fluid is decanted and the organ pulp is dried at 37°C. in a Faust-Heim desiccator. The vaccine is said to be harmless, to keep for a considerable period, and to confer immunity for a year. The author tested samples of the vaccine, from three to 16 months old, on 22 cattle, using nine virus controls. The virus inoculation was given over five weeks after the vaccination. All the vaccinated animals exhibited a mild febrile reaction, whilst all the controls contracted severe rinderpest and died. After vaccination a mild febrile reaction occurs, but pooled blood from the vaccinated animals, taken on the 16th day, failed to produce rinderpest when inoculated into two susceptible calves, thus excluding the possible danger that vaccinated animals might be virus carriers.
—U. F. RICHARDSON.

JACOTOT, H. (1935). Essai de vaccination contre la peste bovine par voie veineuse. [**Trial of Intravenous Vaccination against Rinderpest**].—*Bull. Soc. Path. exot.* **28.** 34-36. 1 table. [1 ref.]

A toluol and glycerol vaccine of the pulp of the lymphatic glands and spleen of cattle suffering from rinderpest, when administered intravenously, failed to give protection against a subsequent inoculation of virulent blood, though the vaccine was proved to confer protection when administered subcutaneously.
—U. F. RICHARDSON.

PYL, G., & KLENK, L. (1933). Haltbarkeitversuche mit dem Virus der Maul- und Klauenseuche. [**Resistance of the Virus of Foot and Mouth Disease**].—*Zlb. Bakt. I. (Orig.).* **128.** 161-171. 6 tables. [16 refs.]

It is well known that a medium of pH 7·5 has a suitable hydrogen ion concentration for the survival of the virus of foot and mouth disease, whilst this virus dies immediately at pH 11. It has now been shown that, although the virus tends to be destroyed at a slightly acid pH of 3·5 to 6·5, it remains viable for considerable periods in strongly acid media of pH 2 to 3. Lowering the temperature of the medium increases the viability of the virus, irrespective of the hydrogen ion concentration. An M/15 buffer solution (pH 6·8), containing 50 per cent. by volume of commercial glycerin (85 per cent. pure), is recommended as a preservative for virus. Though virus is rapidly destroyed in 90 per cent. glycerin, it survives for a considerable time in water-free glycerin.—E. J. PULLINGER.

MEIER, J. J. (1934). Bakteriophagie in der Maul- und Klauenseuche ? [**Bacteriophage in Foot and Mouth Disease**].—*Berl. tierärztl. Wschr.* **50.** 389-391.

It is argued that it is logical to assume that a bacteriophage against the virus of foot and mouth disease must exist and that only in this way can various epidemiological data be explained. The author also claims to have controlled outbreaks of the disease by injections of a filtrate of faeces collected from an animal which had just passed successfully the crisis of infection.—E. J. PULLINGER.

I. HOMUTOV, P. (1934). L'action du chloroforme sur le virus O Vallée. [**Effect of Chloroform on Foot and Mouth Disease O Type Virus**].—*C. R. Soc. Biol. Paris.* **117.** 868-871. [1 ref.]

II. HOMUTOV, P. (1934). La conservation du virus aphteux O Vallée par le chloroforme. [**Preservation of the Foot and Mouth Disease Virus Vallée O by Chloroform**].—*Ibid.* 947-950. [2 refs.]

III. HOMUTOV, P. (1934). La conservation du virus O Vallée par le goménol. [**Preservation of Virus Vallée O (Foot and Mouth Disease) by " Goménol "**].—*Ibid.* 950-952.

I. GALEA [this *Bull.* **3.** 79.] claims to have prepared an avirulent vaccine against foot and mouth disease by means of chloroform. He attributes the loss of virulence and conservation of the antigenic property of the vaccine to the action of chloroform.

In this paper Homutov relates his experiments with this vaccine, and states that they contradict the findings of GALEA. He found that chloroform conserved the virulence of the virus and that it had no influence at all on the production of immunity in guinea pigs.

II. This paper details further investigations by Homutov with regard to the action of chloroform. His experiments were performed at pH 7·6 in one case and at pH 6·7 in another. Those at pH 7·6 confirmed his findings recorded in I. At pH 6·7 the conservative action of chloroform was even more marked.

III. Pursuing his investigations, the author found that when " goménol " (the essence of *Malaleuca viridiflora*) was added in a proportion of 1 per cent. to a 1 per cent. saline suspension of foot and mouth disease Vallée O virus at pH 7·6, the virulence of the virus was preserved for 47 days, as compared with a duration of 28 days in the case of virus suspension under the same condition but without " goménol ".—GWILYM O. DAVIES.

VERGE, J. (1933). Les maladies communes à l'homme et aux animaux. VI. L'anémie infectieuse des équidés ou maladie de Vallée. [**Diseases Common to Man and Animals. VI. Equine Infectious Anaemia**].—*Rev. gén. Méd. vét.* **42.** 729-732. [4 refs.] [For abst. of previous article of this series, see this *Bull.* **4.** 207].

This is a note on two authentic cases of equine infectious anaemia occurring in human beings, viz. the case of LÜHRS in 1920 and that of PETERS in 1924. The symptoms shown by each are given in detail together with the inoculation experiments carried out in confirmation of diagnosis. There is a discussion on the possible danger to man involved in the use of sera of equine origin, and of horse-flesh. There is also a note on the possible relationship between infectious anaemia of the horse and pernicious anaemia of man.—C. DAVENPORT.

RICHTERS, C. E. (1934). Erfahrungen der Heeresverwaltung bei der ansteckenden Blutarmut der Pferde. [**Experience with Equine Infectious Anaemia in the German Army**].—*Z. Veterinärk.* **46.** 166-172.

Various methods used for the diagnosis of this disease are discussed, but no new information is forthcoming. Liver puncture, using a specially constructed trochar, is a helpful diagnostic procedure in doubtful cases, smears of the pulp being examined to see whether the cellular reaction is characteristic of infectious anaemia.—E. J. PULLINGER.

WALL, S. (1934). **On the Histological Alterations in the Liver and Kidneys, in Pernicious Anemia, in Horse (Infectious Anemia in Horse).**—*Acta path. microbiol. scand.* Suppl. 18. pp. 225-237. 6 figs. on 6 plates. [In English].

Histological examination of the livers and kidneys of six horses, which exhibited clinical symptoms of infectious anaemia, revealed chronic serous hepatitis and chronic serous nephritis. The liver alterations are described as a thickening of the interlobular connective tissue and the appearance of a large number of lymphoid cells in the liver capillaries. In the kidneys, there was some thickening of the vascular walls of the glomeruli and fibrous adherence between the glomeruli and the renal capsule ; there was an oedematous thickening of the connective tissue between the uriniferous tubules and a pronounced increase of lymphoid cells in the kidney blood vessels.—U. F. RICHARDSON.

I. VELU, H., ZOTTNER, G., FAURE, L., & SARTHOU. (1934). Essais de vaccination contre l'anémie infectieuse des équidés par virus formolé. [**Vaccination with Formolized Virus against Equine Infectious Anaemia**].—*Bull. Acad. vét. Fr.* **7.** 155-157. [3 refs.]

II. PANISSET, L., CARPENTIER, G., GUILLOT, G., & PFLIEGER, C. (1934). Contribution au diagnostic de l'anémie infectieuse du Cheval. [**The Diagnosis of Equine Infectious Anaemia**].—*Ibid.* 282-287. [7 refs.]

III. VELU, H., DAVID, M. L., FAURE, L., & CARPENTIER, C. J. (1934). Essais de diagnostic de l'anémie infectieuse des équidés par réactivation. [**Diagnosis of Equine Infectious Anaemia by Reactivation**].—*Bull. Soc. Path. exot.* **27.** 306-308. [1 ref.]

I. The authors refer to the contradictory results obtained in the protection of horses against infectious anaemia by the use of formolized virus, and record the results of their own experiments in Morocco. Forty horses were concerned. Some of these received formolized virus ; the remainder acted as controls. All were kept under observation in an infected area for a year. At the end of this period it was found that there was no difference in the incidence of the disease in the inoculated and the control animals. The authors conclude that dead virus confers no immunity.

II. The authors first discuss the possibility of the co-existence of tuberculosis and infectious anaemia in horses. Examples of such dual infection are reviewed, and cases of mistaken diagnosis quoted. The second part of the paper is a study of the reaction to tuberculin injections by healthy horses and those affected with infectious anaemia, and the question of whether reactions obtained in the latter case should be regarded as non-specific consequent upon infection with infectious anaemia, or indicative of the coexistence of tuberculosis.

III. The authors deplore the lack of progress made in the study of infectious anaemia, and ascribe this to the difficulty of establishing a definite diagnosis. They attempted to advance the method of diagnosis based upon recrudescence artificially induced, and employed a complex arsenical preparation, " tryparsol ", intravenously and oil of sulphur intramuscularly for this purpose. These, however, proved of no value.—C. DAVENPORT.

SCHÜRMANN, E. (1933). Pathologische Organbefunde beim sogenannten Hoppegartener Husten. **[The Pathology of Hoppegarten Cough – Equine Infectious Bronchitis]**.—*Berl. tierärztl. Wschr.* **49.** 161-164. 4 figs. [4 refs.]

The author made a detailed examination of four horses killed when suffering from Hoppegarten cough and the changes found in the respiratory system are given.

The condition is primarily a bronchitis, which may spread into the lung tissue, causing a lobular pneumonia. The type of inflammation is typically catarrhal, but some cases also show a purulent exudate. The chronic form of indurative broncho-pneumonia also occurs.

Histologically the lungs and pleura show an intense eosinophilia. Most cases also show a hyperaemia of the trachea.—J. E.

BURT, J. H. (1934). **Studies in Hog Cholera [Swine Fever] Immunity.**—*J. Amer. vet. med. Ass.* **84.** 91-99. 10 tables. [4 refs.]

The objects of the experiment were :– (1) to determine if pigs born of immune sows could be immunized successfully and permanently against swine fever if artificially inoculated with virus during their nursing period ; (2) to determine if the sows immunized in this way would confer temporary immunity on their offspring, and (3) to determine the permanence of the immunity.

The results obtained indicated that it was possible to produce permanent immunity in young pigs if they were inoculated with the virus before they were 18 days old. Sows immunized in this way transmitted the immunity to each litter farrowed.

The immunity was permanent enough to resist large doses of virus when injected 94 days, 143 days or 18 months after the first dose.—N. H. BROOKSBANK.

KENDA. (1934). Die Bekämpfung der Schweinepest in Jugoslawien. **[Control of Swine Fever in Yugoslavia]**.—*Z. InfektKr. Haustiere.* **46.** 296-303. 1 table. [39 refs.]

In Yugoslavia, during 1933, more than 200,000 swine in various premises, some badly infected, were vaccinated against swine fever by the serum-simultaneous method. The mortality averaged 3·4 per cent. No deaths occurred as a result of the use of the virus. Pregnant sows of improved breeds were vaccinated during the first two months, and Mongolians during the first three months, of gestation. Active immunization against swine erysipelas should take place three or four weeks after virus inoculation.—A. W. N. PILLERS.

MANNINGER, R., & CSONTOS, I. (1934). Ueber die Empfänglichkeit von Ferkeln immuner Mütter für das Schweinepestvirus. **[Susceptibility to Swine Fever of Young Pigs from Immune Mothers]**.—*Arch. wiss. prakt. Tierheilk.* **67.** 239-249. [4 refs.]

After reviewing the work of several authors who have shown that the piglets of sows immune to swine fever apparently also possess an immunity, Manninger and Csontos carried out numerous experiments themselves. Their work was with two groups of piglets of immune sows, viz :– those reared on the sow's milk and those given cows' milk. The latter group was, as a whole, less resistant to virus inoculation. The piglets were infected between the fourth and 30th weeks of age. The authors consider that the immunity was partly congenital and partly due to the immune body content of the sow's milk.

The authors conclude that the method of vaccinating suckling pigs of immune mothers with virus is untrustworthy, especially in view of the satisfactory results which follow the use of the simultaneous method.—A. W. N. PILLERS.

—. (1934). Enzootische Ferkelbronchopneumonie. [**Enzootic Broncho-Pneumonia of Piglets (Swine Influenza)**].—*Prag. tierärztl. Arch.* **14.** 231-233.

Broncho-pneumonia, or swine influenza, is of a very infectious character. The primary cause is a filtrable virus, the organisms found in the lung lesions being merely secondary invaders. The predisposing cause of the condition is nutritional deficiency.—D. J. ANTHONY.

I. LITTLE, G. W. L. (1934). **Serum Concentrate-Living Virus Immunity against Canine Distemper. Second Report.**—*J. Amer. vet. med. Ass.* **85.** 576-590. 5 tables. [9 refs.]

II. LENTZ, W. J. (1934). **Further Observations on the Use of Serum Concentrate (Little) to Control Canine Distemper.**—*Ibid.* 590-592. [1 ref.]

III. MORRIS, M. L. (1934). **Report on Serum Concentrate (Little).**—*Ibid.* 595-596. [2 refs.]

These three papers deal with the clinical aspect of distemper immunization and treatment.

I. The first part of this paper deals with the simultaneous injection of anti-distemper serum and living virus as a method of producing immunity against distemper. Clinical experiences covering a large number of cases are quoted to support the claim that the simultaneous injection of serum and virus produces a strong lasting immunity. Evidence is given that a more powerful immunity is produced if 48 to 72 hours are allowed to elapse after injecting the virus before administering the appropriate dose of serum, but it is pointed out that this procedure cannot be adopted in general practice. The author has had considerable experience of using the serum-virus method on dogs, regardless of previous exposure to infection, and of its application immediately prior to dosing for worms or operative interference ; he claims perfect safety in immunizing a young dog in these circumstances.

The second part of the paper deals with the value of concentrated serum in the treatment of distemper. Emphasis is laid on the value of a large initial dose of serum.

[The first part of the paper refers to eleven charts which are not published].

II. A brief discussion on the merits of the concentrated serum virus method of immunization against distemper. The author advocates this method.

In the treatment of distemper a large initial dose is said to be of value in the treatment of uncomplicated virus disease, but once secondary invaders have obtained a foothold, serum is of little value.

III. The experience of a practising veterinary surgeon who supports the claims made for concentrated serum by the authors of I and II [see also this *Bull.* **5.** 73].—GEO. F. BODDIE.

DALLING, T. (1934). **Recent Observations on Canine Distemper Immunisation.** —*Vet. Rec.* **14.** 1349-1354.

A paper presented at a meeting of the Southern Counties Division of the National Veterinary Medical Association, in which the author briefly traces the history of distemper immunization. Both the vaccine-virus and serum-virus methods are discussed. In each case the author stresses the fact that virus of high potency is essential. In the case of the serum-virus method, it is recommended that a period of one hour be allowed between the two injections.—G. W. DUNKIN.

BOUVIER, G. (1934). Mukupa : Rage canine congolaise ? (Lomani-Kasai).

[**Canine Rabies in the Congo**].—*Bull. Soc. Path. exot.* **27.** 821-825. 2 tables. [12 refs.]

" Mukupa " is a disease of dogs in the Lomani-Kasai area of the Belgian Congo. The disease presents all the clinical symptoms of rabies, but occurs as small local outbreaks which show little tendency to spread, and die out in a short time ; human beings are rarely bitten, and no fatal cases have been reported.

Experimentally the disease could be conveyed to guinea pigs and rabbits by subdural inoculation of brain emulsion, the incubation period being eight to ten days in the guinea pig and ten to 15 days in the rabbit.

No Negri bodies could be detected.—U. F. RICHARDSON.

I. —. (1934). **Separation of Rabies Virus from Brain Tissue.**—*Brit. med. J.* July 21st. 124. [2 refs.]

II. SANKARAN, G., IYENGAR, K. R. K., & BEER, W. A. (1934). **A Preliminary Note on the Electrical Charge carried by the Rabies Virus.**—*Indian J. med. Res.* **21.** 909-916. 2 figs., 2 tables.

III. MCCARRISON, R., SANKARAN, G., & BEER, W. A. (1934). **Electrophoresis Experiments with the Virus of Rabies.**—*Ibid.* 917-934. 2 tables. [5 refs.]

IV. REMLINGER, P., & BAILLY, J. (1934). Action de la congélation sur le virus rabique. [**Effect of Freezing on Rabies Virus**].—*C. R. Soc. Biol. Paris.* **116.** 407-409. 2 tables.

I., II. & III. A series of experiments is described in which rabies viruses (street or fixed), specially prepared by emulsifying brain tissue in sheep's serum, were separated from the menstruum by electrophoresis and collected at the positive pole. The apparatus consisted of two glass cells, containing buffer phosphate, each closed at the top but open at the bottom and having a side arm which dipped into the fluid to be subjected to the current. Each cell, plugged at the open end with agar, stood in salt solution, which in turn was connected by means of agar bridges to the copper sulphate solutions containing the respective electrodes. After passing the current, material for test was collected from the " positive " or " negative " cells. A current of 4 milliamperes was used and a pH value of 7·38 maintained.

In the series of experiments 33 animals, rabbits or sheep, were inoculated with material collected from the positive cell ; 30 developed rabies, two died accidentally and one failed to react. None of the 33 inoculated from the negative cell developed rabies. A final experiment confirmed the attraction between the positive pole and the rabies virus ; a filter candle was inserted in the apparatus, so that material passing from the rabies suspension to the positive pole had to pass the candle. After passing the current for 24 hours, the fluid nearest the positive pole, furthest from the original material, was found to be definitely more virulent than material in the candle or the arm leading to the pole.

IV. The authors have examined the survival of virus in brain tissue kept frozen or kept at +6°C. in glycerin. They found that frozen brains retained their virulence for at least 25 months, whilst some brain kept in glycerin at +6°C. was still virulent 901 days later.—NORMAN HOLE.

LEVADITI, C., SCHOEN, R., & LEVADITI, J. (1934). Evolution du virus rabique des rues dans les éléments épithéliaux dérivés de l'ectoderme et de l'endoderme. [**Development of the Virus of Street Rabies in Epithelial Tissue derived from Ectoderm and Endoderm**].—*C. R. Soc. Biol. Paris.* **117.** 767-770. 1 table. [3 refs.]

The authors had found that if street rabies virus was inoculated on to the

scarified surface of the cornea or into the anterior chamber of the eye of the rabbit, bodies resembling Negri bodies developed in the epithelial cells of the cornea. In the present work they inoculated street rabies virus into rabbits, into the conjunctival sac, intranasally, into the mucous membrane of the tongue, into the trachea, into the mucous membrane of the small intestine and into the adrenal gland. In all cases, infection occurred without the production of any specific oxyphile corpuscles resembling Negri bodies in the tissues of the site of infection.—A. Brownlee.

Plantureux, E. (1933). Avantages de la vaccination antirabique des chiens avant morsure dans la prophylaxie de la rage. Contribution à l'étude des accidents paralytiques et des moyens de les éviter. [**Advantages of Antirabic Vaccination of Dogs in the Prophylaxis of Rabies**].—*Arch. Inst. Pasteur. Algér.* **11.** 513-521. [1 ref.]

Paralytic sequelae of antirabic vaccination, which have been somewhat prominent in recent years, are attributed by the author mainly to curtailment of the period of formolization of the virus material although other possible causes are also discussed, namely, individual susceptibility, heterology of the nervous tissue, intercurrent disease and the strain of virus used in preparation of the vaccine material. *A propos* of the latter, since the introduction of a Tangerian strain, which causes only paralytic rabies in the rabbit, over 2,000 dogs have been vaccinated without complications.

The mode of preparation of vaccine has been slightly modified in that nervous material is subjected to preliminary treatment by equal parts of glycerol and tap-water for several days ; the concentration of formol has been increased from four to six parts per 1,000 and the period of incubation of the formol-nervous tissue mixture has been lengthened from seven to 14 days.

Control of rabies by vaccination of dogs is held to be extremely efficacious, provided that it be done on a wide scale. The latter seems unlikely of achievement except by legal compulsion, in the absence of which vaccination might be encouraged, for example, by remission of the dog-tax. State expenditure on canine antirabic vaccination would be compensated by reduction of the cost of human treatment.—J. W. Emslie.

Urbain, A. (1933). Contribution à l'étude de la gastro-entérite infectieuse des chats. [**Infectious Gastro-Enteritis of Cats**].—*Ann. Inst. Pasteur.* **51.** 202-214. [11 refs.]

This is a study of the causal virus of gastro-enteritis of cats. The virus survives in pure or 50 per cent. glycerin for 35 to 50 days and in milk or normal saline for five days. Desiccation rapidly kills it and one minute at 100°C., 30 minutes at 56°C. and 48 hours at 37°C. are also lethal.

The author reports success in the immunization of susceptible cats with a formolized spleen vaccine [see also this *Bull.* **5.** 19].—J. E.

Plantefol, L., & Plotz, H. (1934). Recherches respiratoires sur le virus de la peste aviaire. [**Respiration of the Virus of Fowl Plague in Tissue Culture**]. —*C. R. Soc. Biol. Paris.* **117.** 402-404. [4 refs.]

A study was made of the gaseous changes occurring in tubes containing Drew's fluid and embryonic tissue alone and inoculated with virus, after being kept at 37°C. for three days.

It was found that there was less CO_2 given off in the tubes containing virus, the respiratory quotient remaining almost the same in both. There was no evidence to indicate any respiration of the virus.—J. E. Wilson.

PLOTZ, H. (1934). Nouvelles observations sur la culture de la peste aviaire. **[New Observations on the Cultivation of Fowl Plague Virus].**—*C. R. Soc. Biol. Paris.* **116.** 956-957. [9 refs.]

Details are furnished of the cultivation of fowl plague virus on ten-day-old chick embryos.

4 c.c. of modified Drew's fluid sterilized by filtration is placed in Erlenmayer flasks of 75 c.c. capacity. To this is added 0·5 g. of finely minced embryos in 1 c.c. of the modified Drew's fluid. These flasks are kept at 37°C. for 24 hours and examined for sterility. 1 c.c. of a mixture of several cultures is introduced.

The flasks are kept in the incubator for three days to test for sterility and then transferred to the cold store at +4°C. until material is required for the next sowing. This method had permitted cultivation for two and a half years.

Material from the 100th passage killed a fowl in 48 hours in a dilution of 10^{-5} and the previous culture killed in a dilution of 10^{-6}.—NORMAN DOBSON.

TOPACIO, T. (1934). **Cultivation of Avian-Pest Virus (Newcastle Disease) in Tissue Culture.**—*Philipp. J. Sci.* **53.** 245-252. 1 table. [12 refs.]

Multiplication of the virus of Newcastle disease was obtained by cultivation, in a medium consisting of chick-embryo tissue and plasma, for 31 generations over a period of 112 days.

Culture virus did not appear to differ from natural virus in its ability to induce active immunity as shown by the susceptible birds immunized with the former and resisting the injection of the latter.

In some of the experiments the cultures became contaminated, but the virus was freed from contamination without difficulty by filtration. A certain amount of contamination did not appear to interfere with the viability and multiplication of the virus.—NORMAN DOBSON.

KOMAROV, A. (1934). **A Study on "Cell-Inclusion Disease" in Fowls. I. On the Identity of Acute Cell-Inclusion Disease and Fowl Plague. II. On the Diagnostic Value of the "Chromatic-Inclusions" in the Leucocytes.**—*J. comp. Path.* **47.** 282-295 and 296-301. 10 figs., 3 tables. [28 refs.]

Komarov made a study of the disease of fowls in Palestine that has been described under the name "cell-inclusion disease" by GILBERT and SIMMINS [this *Bull.* **5.** 76]. This is apparently the same disease as was reported from Nigeria by MACFIE [(1914). *Ann. trop. Med. Parasit.* **8.** 41.] and from Palestine by ADLER [(1925). *Ann. trop. Med. Parasit.* **19.** 127].

An acute form of the disease, in which death occurs in from two to five days, and a chronic form which is not usually fatal, have been described.

In an outbreak investigated by Komarov the mortality in the field was practically 100 per cent. among fowls, whereas pigeons were not affected. Similar results were obtained by the inoculation of organic suspensions.

Filtration experiments proved the existence of a virus which caused the death of susceptible fowls in from 18 to 60 hours, with a maximum period of four days; 1 c.c. of a 1 : 500,000 dilution of blood was fatal for fowls. The disease was only weakly contagious in cage experiments.

Serum-virus neutralization tests showed that the Palestine virus and a known fowl plague virus were serologically indistinguishable.

Komarov concludes that the "cell-inclusion disease" is in all respects identical with the classical fowl plague.

In the second part of the paper, Komarov states that chromatic inclusions identical with those described by ADLER are found in a variety of infections.

Attempts to prove the existence of a virus in fowls affected with " chronic cell-inclusion disease " gave negative results.—T. M. DOYLE.

I. THORP, F., Jr., & GRAHAM, R. (1934). **A Note on the Histopathology of Infectious Avian Laryngotracheitis.**—*Poult. Sci.* **13.** 102-109. 12 figs. [20 refs.]

II. BURNET, F. M. (1934). **The Propagation of the Virus of Infectious Laryngo-Tracheitis on the Chorio-Allantoic Membrane of the Developing Egg.**—*Brit. J. exp. Path.* **15.** 52-55. 4 figs. on 1 plate, 1 table. [4 refs.]

I. The most consistent histopathological changes in infectious laryngo-tracheitis appear in the mucosa and submucosa of the larynx and trachea and, to a lesser degree, in the bronchi and lungs.

Oedema, haemorrhage and cellular infiltration, with intranuclear inclusions in the epithelial cells of the larynx and upper trachea, are frequently seen. Microscopic lesions may also be present in the lungs, kidneys, myocardium and liver, suggesting the systemic invasion of the virus.

The microscopic haemorrhagic lesions in myocardial and renal parenchyma may contribute to the dyspnoeic syndrome, which is not explained in all cases by the presence of marked gross changes in the upper respiratory tract.

II. A report is given of experiments showing the propagation of the virus of laryngotracheitis in the chorio-allantoic membrane of the developing egg. The lesions produced in the membrane are primarily due to proliferation and necrotic changes in the ectodermal layer. The proliferating cells frequently show typical intranuclear inclusions similar to those found in the tracheal lesions.

The virus was passed through eggs to the seventh generation. Material collected from the third passage in the egg, when inoculated into chickens, caused the typical symptoms with fatal results. Material from the seventh passage, when inoculated into chickens, caused mild lesions, but no symptoms were noted.

—NORMAN DOBSON.

BEAUDETTE, F. R., & HUDSON, C. B. (1934). **Keeping Qualities of Incubator Dried Laryngotracheitis Virus as Determined by Cloacal Inoculation.**—*Cornell Vet.* **24.** 163-171. 6 tables.

Exudate from birds affected with laryngotracheitis was collected and dried at incubator temperature during a period of about two hours, and subsequently stored under conditions of refrigeration.

After long storage, such material may reproduce the disease in all susceptible birds inoculated intratracheally, but may not be sufficiently potent to set up a " take " when applied to the cloacal mucosa for purposes of immunization. Experiments were, therefore, planned to get a better idea of the keeping qualities of the virus, prepared in this manner, by means of cloacal application.

Two lots of virus were used and, after three months' storage, showed about equal potency, but, after six months' storage, lot two showed a marked decrease in potency. With each group of virus the application was made to the cloacal mucous membrane by means of (1) swab, (2) brush. The experiments showed that the application by means of a swab appeared to be slightly more advantageous, producing only 25 negative results in comparison with 35 negatives using a brush [number of birds dealt with not stated]. This was irrespective of the virus or dose applied.—NORMAN DOBSON.

SCOTT, J. P., & BRANDLY, C. A. (1934). **Investigations of Two Outbreaks of Laryngotracheitis.**—*Vet. Alum. Quart.* **22.** 23-31. 2 tables. [12 refs.]

The investigations show that this disease greatly reduces egg production.

The effect of bad weather on the severity of the symptoms of laryngotracheitis is suggested. Slight losses were incurred during the mild weather of 1931 and severe losses occurred during the outbreak in the very cold weather in 1932. 47 per cent. of the 63 deaths during the 1932 outbreak occurred during the first five days of the disease, and 92 per cent. during the first ten days. Previous reports show that losses from laryngotracheitis chiefly occurred during a period of 11 to 15 days.

Twenty-three birds, which were exposed [but not stated or proved to have been infected] in the 1931 outbreak, were found to be as susceptible to laryngotracheitis in 1932 as were ten-month-old clean birds.

It was found that birds exposed to indirect contact, or to a very short contact, with carrier birds in summer did not contract the disease.

Eggs from affected flocks were not shown to carry surface contamination with the virus.

Cloacal vaccination of nine-month-old birds resulted in the production of symptoms of typical laryngotracheitis and death.

A few birds were found to be intermittent carriers of laryngotracheitis.

—NORMAN DOBSON.

BIERBAUM, K. (1935). Weitere Untersuchungen über Geflügelpocken. [**Further Investigations on Fowl Pox**].—*Z. InfektKr. Haustiere.* **47.** 147-160. [5 refs.]

The duration of immunity against fowl pox produced by pigeon pox vaccine is studied. Two different vaccines were inoculated into three-month-old Leghorn fowls, and both produced satisfactory reactions. One month after vaccination seven birds out of ten showed complete immunity and three partial immunity. After three months, six were completely and four partially immune. After six months, two were completely and seven partially immune whilst one showed no immunity. After 12 months, two out of four birds were completely immune and two partially so. Immunity was tested by prolonged contact with infected birds.

It is considered that there are no grounds to justify the statement that this particular class of vaccine is likely to be followed by any post-vaccinal secondary infection. The use of any vaccine, as a protective or curative agent, in a flock already in the throes of an outbreak of the disease is only desirable under exceptional circumstances, whilst the vaccination of a flock already suffering from some other disease is also contraindicated.—E. J. PULLINGER.

MACKENZIE, R. D. (1933). **The Cultivation of the Virus of Rift Valley Fever.**—*J. Path. Bact.* **37.** 75-79. 3 tables. [15 refs.]

An account of the cultivation of the virus of Rift Valley fever from mice on a medium composed of chick embryo and Tyrode's solution.

Thirteen successive culture passages were grown by this method without effecting any alteration in virulence.—J. E.

BEDSON, S. P., & BLAND, J. O. W. (1934). **The Developmental Forms of Psittacosis Virus.**—*Brit. J. exp. Path.* **15.** 243-247. 4 figs. [4 refs.]

Infection of susceptible tissues or tissue cultures with elementary bodies of the psittacosis virus is followed by the formation of apparently homogeneous masses ; these are in turn replaced by colonies of bodies about 1μ in diameter and finally, after repeated division, the stage of elementary bodies is regained. Previous to this work, the authors thought it possible that this cycle of changes

was of a protozoal nature, but closer examination of the apparently homogeneous virus masses has now revealed them as particulate colonies of larger forms. This fact can be demonstrated in Giemsa or Castaneda stained preparations by prolonged differentiation in absolute alcohol or safranin respectively. In the authors' opinion, therefore, psittacosis virus is a micro-organism with bacterial affinities, showing larger forms in the early stages of development.—NORMAN HOLE.

SPEAR, B. E. (1934). **The Periodicity of Influenza.**—*Lancet.* **227.** 1331-1333. 4 figs., 1 table.

By means of an examination of the weekly returns of the Registrar-General for the past 44 years, charts have been drawn up showing the weeks of maximum prevalence of influenza with the number of deaths, and the intervals in weeks to the subsequent epidemics. It is suggested that, by consulting such tables, an approximate forecast of an outbreak might be made.

[It has been suggested that in certain virus diseases of the lower animals, e.g. foot and mouth disease, a definite periodicity can be recognized. It is possible that, from a compilation and analysis of figures similar to those utilized by Spear, tables might be prepared which would provide a way of forecasting these epizootics].—R. E. GLOVER.

BRODIE, M. (1935). **Active Immunization in Monkeys against Poliomyelitis with Germicidally Inactivated Virus.**—*J. Immunol.* **28.** 1-18. 7 tables. [49 refs.]

Up to the present, attempts to immunize monkeys against the virus of poliomyelitis have met with little success. In this paper the author's experiments show " that a proper dose of formalized virus may produce, in the majority of monkeys, an active immunity sufficient to enable them to withstand intracerebral inoculation of one or more infective doses of virus and that virus treated with formalin is a better antigen than is phenolized virus ". The virus was found to be extremely resistant, as compared with the rabies virus, to the action of ether.

—GWILYM O. DAVIES.

I. LE CHUITON, F., & BOURGAIN, M. (1934). Tentative de mutation d'un virus du typhus murin en virus boutonneux, par passage dans l'organisme de *Rhipicephalus sanguineus.* [**Attempt to Change the Virus of Mouse Typhus into Sporadic Typhus (Marseilles Strain) by Tick Passage**].—*Bull. Soc. Path. exot.* **27.** 825-830. 2 charts.

II. BRUMPT, E. (1934). Au sujet des changements de propriétés biologiques des germes chez divers hôtes vecteurs vicariants. [**Alterations in Biological Properties of Pathogenic Agents by Passage through Different Invertebrate Hosts**].—*Ibid.* 830-831.

I. These experiments tend to confirm the duality of mouse typhus virus and sporadic typhus (Marseilles type). Larvae, obtained from clean ticks which had engorged on guinea pigs infected with mouse typhus (Toulon strain), were injected into guinea pigs. No reactions followed and the animals were subsequently fully susceptible to mouse typhus virus (Toulon or Casablanca strains). Since it is known that endemic typhus is hereditarily transmissible through the tick (*R. sanguineus*) while mouse typhus is not, it is suggested that no mutation in the direction of endemic typhus had taken place.

The experiment also affords additional evidence that female ticks do not pass mouse typhus virus to their progeny.

II. Brumpt is in agreement with LE CHUITON and BOURGAIN. He is strongly of the opinion that infective organisms (*Trypanosoma*, *Spirochaeta*, *Plasmodium*,

etc.) are not modified in any way by passage through intermediate invertebrate hosts. He rejects the view that all the exanthematous fevers have their origin in a single parent strain which has undergone mutation by passage through different species of ticks, fleas, lice, etc. He supports his contention by various examples from the literature.—R. E. GLOVER.

WOLLMAN, E. (1934). Bactériophagie (autolyse hérédocontagieuse) et bactériophages (facteurs lysogènes). [**Bacteriophagy (Heredo-Contagious Autolysis) and Bacteriophages (Lysogenous Factors)**].—*Bull. Inst. Pasteur.* **32.** 943-955. [40 refs.]

The author reviews the literature on the bacteriophage, especially concerning the nature of the lytic phenomenon. There are two classical theories, one that bacteriophage is a parasite and similar to filtrable viruses, provided they are considered to be living organisms ; the other theory is that the lytic action is due to the production of enzymes. It is pointed out that each school has its partisans who interpret their findings accordingly. An attempt is made to reconcile these two views and the suggestion is put forward that the bacteriophage phenomenon is a type of bacterial mutation, this mutation being of a hereditary nature. It is suggested that this is a similar view to that put forward concerning the aetiology of transmissible tumours of fowls. The filtrable agent is here considered not to be of the nature of a living filtrable virus, but to consist of actual elements of the cells of the tumour.—R. LOVELL.

INVERTEBRATE VECTORS OF DISEASE.

OLENEV, N. O. (1934). **The Northern Limits of Tick Distribution.**—*Bull. Acad. Sci. U.R.S.S.* No. 2-3. 367-388. 2 plates, 3 maps. [59 refs.] [In Russian : French summary. Abst. from abst. in *Rev. appl. Ent.* **22.** 215-216].

Data on the world distribution of 15 genera of Ixodoidea are summarized, with special reference to their northern limits. A systematic list is given of the 71 species involved, with records of the northernmost points at which they have been taken, being caught in most instances while still on their hosts.

In Asia the boundary lies considerably further south than the northern limit of domestic and wild bovines, whereas in North America these boundaries almost coincide.—J. E.

MATIKASHVILI, N. V. (1932). **Contribution to the Fauna and Geographical Distribution of the Ticks, Ixodoidea, in the SSR of Georgia.**—*Mag. Paras. Inst. zool. Acad. Sci. U.R.S.S.* **3.** 223-234. 10 figs., 1 table. [In Russian : German summary] [Copied *verbatim* from *Rev. appl. Ent.* **23.** 55].

In view of the fact that cattle in Georgia suffer severely from piroplasmosis and other protozoan diseases, investigations were carried out in 1930 and 1931 on the presence of ticks in that country. The 14 species found were *Ixodes ricinus*, L., *Haemaphysalis inermis*, Bir., *H. cinnabarina punctata*, C. & F., *H. cholodkovskii*, Olen., *H. sulcata*, C. & F., *Dermacentor niveus*, Neum., *D. silvarum*, Olen., *Rhipicephalus sanguineus*, Latr., *Hyalomma detritum*, P. Schultze, *H. marginatum*, Koch, *Argas persicus*, Oken, *Ornithodorus lahorensis*, Neum., *Rhipicephalus bursa*, C. & F., *R. sanguineus*, Latr., and *Boophilus annulatus calcaratus*, Bir. Notes are given on their local distribution, dates of capture and hosts. Evidence was obtained that certain ticks occur in pastures at altitudes of over 6,500 ft. Notes to facilitate identification are given on the morphology of the nymphs of *B. annulatus calcaratus* and of the genera *Hyalomma*, *Rhipicephalus* and *Haemaphysalis*.

COOLEY, R. A. (1934). **A Search for Tick Parasites in South Africa.**—*Onderstepoort J. vet. Sci.* **3.** 23-42. 1 table. [29 refs.]

The author records the results of his visit to South Africa in 1928 in search of parasites of ticks. *Hunterellus hookeri* was found in six different species, and a possible new parasite belonging to the Chalcididae or Proctotrupidae was encountered.—E. M. ROBINSON.

CORSON, J. F. (1935). **A High Rate of Salivary Gland Infection of** *Glossina morsitans* **with** *Trypanosoma rhodesiense.—Trans. R. Soc. trop. Med. Hyg.* **28.** 501-504. [2 refs.]

Salivary gland infections occurred in 51 out of 85 (60 per cent.) *G. morsitans* fed on a reedbuck infected with *T. rhodesiense*, under normal laboratory conditions of temperature. In a second experiment, batches of flies were fed on the same reedbuck and on a monkey infected with the same strain of trypanosome. Whilst 33 per cent. of the flies fed on the reedbuck developed a salivary gland infection, only 1·1 per cent. of those fed on the monkey showed such an infection. Another strain of *T. rhodesiense* in a man only caused a gland infection rate of 3 per cent. in flies. It is suggested that the explanation probably lies in the special suitability of reedbuck's blood.—U. F. RICHARDSON.

NIESCHULZ, O., & DU TOIT, R. M. (1934). **Handling Mosquitoes for Experimental Purposes under South African Conditions.**—*Onderstepoort J. vet. Sci.* **3.** 79-95. 5 figs.

The writers describe in detail the methods adopted by them for maintaining mosquitoes under laboratory conditions and for feeding them on animals during their experiments on the transmission of horse-sickness and blue tongue during 1932. The humidity factor is of very great importance under South African conditions if mosquitoes are to remain alive. Special cages for feeding mosquitoes on horses and sheep are described.—E. M. ROBINSON.

DISEASES CAUSED BY METAZOAN PARASITES.

HALL, M. C. (1934). **A Manual of the Tactics and Strategy of Warfare on Parasites.**—*N. Amer. Vet.* **15.** No. 1. 40-49, No. 2. 24-34 and No. 3. 24-33. 2 figs.

In his introduction, Hall points out that tactics and strategy have been almost exclusively the interest of military men. They are applicable, however, to a wider field of human activities than to warfare between nations. The principles laid down by Caesar and Napoleon often apply just as well to man's struggle against parasites as they do to international strife.

This contribution is intended to indicate the value and application of the military principles of tactics and strategy in the war on parasites, and an account of the knowledge which we already possess is given in military terminology, intended by the author to lead to a clearer conception of the problems which the subject presents, and to assess the relative values of the various means of approach to them.—E. L. TAYLOR.

FREUND, L. (1934). Die Häufigkeit der Läuse. **[The Distribution of Lice].**—*Münch. tierärztl. Wschr.* **85.** 569-571.

Freund describes the geographical distribution of the common blood-sucking lice of man, the domesticated ungulates, some semi-domesticated and wild

ruminants, and of several rodents. The peculiar distribution of *Solenopotes capillatus* of cattle (Germany, Bohemia and America) is stressed, so is that of the two sheep lice *Linognathus pedalis* (America, Australia and South Africa), and *L. ovillus* (New Zealand, Australia, America, Russia and Scotland). There is still considerable room for research into this subject.—A. W. N. PILLERS.

WERDELIN, K. (1934). Oksebremselarver (Hypodermalarver) hos Militaerheste. **[Ox Warble in Army Horses].**—*Maanedsskr. Dyrlaeg.* **46.** 357-368. 1 fig., 1 table. [26 refs.]

A survey of the literature dealing with the previous findings of ox warbles in horses is given. Larvae were found in nine out of 56 remounts bought in Ireland in the autumn of 1933. The first larvae appeared in the subcutaneous tissue and perforated the skin towards the end of February, the last in the beginning of July, 1934. The processes were found in the seat of the saddle and in the loins and were of exactly the same appearance as those seen in cattle. The horses often displayed unrest at the stage when the larvae perforated the skin. One horse displayed intermittent lameness. The larvae removed were at different stages of development and none of them seemed to be able to pupate.

—H. C. BENDIXEN (COPENHAGEN).

BARANOV, N. (1934). Golubačka musica u godini 1934. [*Simulium reptans columbaczense* **in the Year 1934**].—*Vet. Arhiv.* **4.** 346-393. 5 figs., 1 plate, 2 maps. [30 refs.] [Abst. from abst. in *Rev. appl. Ent.* **22.** 203-204].

A serious outbreak of *Simulium reptans columbaczense* occurred in April and May, 1934, in north-eastern Yugoslavia ; the numbers of animals killed by the flies were estimated as 6,643 sheep and goats, 2,874 cattle, 1,142 pigs, 572 buffaloes, 144 horses and 22 donkeys.

Amongst the repellents tested several proved effective ; one of the best was composed of three parts of rectified kerosene to ten parts of yellow vaseline. About 1 oz. was applied to a horse or cow once daily and one-third of that quantity to a sheep.—J. S. STEWARD.

BHALERAO, G. D. (1934). **The Common Worms of Sheep and Goats in India and their Control.**—*Agric. Live-Stk. India.* **4.** 655-669. 11 figs. on 6 plates.

This paper gives an account of its subject in semi-popular language, for the benefit of agriculturalists. In addition to most of the parasitic worms common in sheep and goats in India, *Fasciola gigantica*, *Paramphistomum cervi*, *Schistosoma bovis*, *S. indicum*, *S. spindalis*, *Stilesia* spp., *Avitellina* spp., *Oesophagostomum columbianum*, *Ostertagia orientalis* and *Varestrongylus pneumoniscus* are mentioned. Notes on methods of control are given in each instance.—E. L. TAYLOR.

I. HALL, M. C. (1934). **Outline for a Campaign against the Common Sheep Liver Fluke and the Large American Cattle Fluke in the United States.**—*N. Amer. Vet.* **15.** No. 6. 48-55. 1 fig.

II. LÜHRS. (1934). Bekämpfung der Leberegel- und Lungenwurmseuche. VII. Mitteilung. **[The Control of Liver Flukes and Lungworms].**—*Arch. wiss. prakt. Tierheilk.* **67.** 385-390. 4 figs., 1 table. [For abst. of previous articles of this series, see this *Bull.* **4.** 744].

I. As a further development of his new way of presenting and of assessing the value of the various measures for the control of parasites, Hall here gives an account of what is known of methods for the control of *Fasciola hepatica* and *F. magna*. The flukes, in this instance, are referred to as " the enemy " and man's

efforts at control are given in the form of a description of a military campaign in which every effort is made to " starve the enemy out ", to " attack it in its strongholds " to " bring about its ultimate defeat " and " eradicate it from man's territories ". Hall considers that this presentation results in a clearer conception of the problem before the parasitologist and a better presentation of the most efficient way of dealing with it.

II. As the extensive use of copper sulphate is too expensive in some marshy districts, the author tried the application of calcium nitrate and of kainit to the pastures and the treatment of special drinking places with copper sulphate. These drinking places are formed by damming the open drains at certain situations, the water weed being removed before the copper sulphate is applied. Comparisons were made between herds of cattle on treated and on untreated marsh pastures, and considerable benefit was found to result, particularly where kainit was used.

—E. L. TAYLOR.

SCHMID, F. (1934). Die Verbreitung des Leberegels in Bayern r.d. Rh. mit besonderer Berücksichtigung des seuchenhaften Auftretens im Jahre 1925. [**The Distribution of Liver Fluke in Bavaria**].—*Z. Parasitenk.* **6.** 528-545. 1 fig., 2 maps. [2 pp. refs.]

Schmid has made a careful survey of the occurrence of fascioliasis in Bavaria, paying particular attention to the wide-spread epidemic in 1925. He has attempted to correlate the occurrence of the disease with the rainfall, temperature, geological formation and systems of farming practised in the various districts. Temperature and rainfall appear to have the greatest influence and, where a high rainfall occurs together with a mild climate, the danger of a severe outbreak is particularly great. Districts of high elevation were comparatively free, although in some the rainfall was high, because the low temperatures inhibit the rapid increase of the snails and quick maturation of the eggs of the liver fluke.

Geological formation played little part except in so far as it indicated impermeable soils and subsoils where drainage was inefficient. Systems of farming also made no difference to the likelihood of the disease appearing so long as ordinary precautions were taken against the acquisition of gross infestation.—E. L. TAYLOR.

CURASSON, G. (1935). Recherches sur le diagnostic des distomatoses à *Fasciola hepatica* et *Amphistomum cervi* par les réactions allergiques. [**The Diagnosis of Infestation with** *Fasciola hepatica* **and** *Paramphistomum cervi* **by Allergic Reactions**].—*Bull. Acad. vét. Fr.* **8.** 77-81. [5 refs.]

Previous authors have claimed successful results in the diagnosis of liver fluke infestation by intradermal inoculation of an antigen prepared by extracting the flukes with ether, or chloroform, or by rubbing a powder made from the dried and pulverized flukes into scarifications in the skin of the suspected host. The author has repeated these experiments with extracts made in an identical way from *F. hepatica* and also *P. cervi*, but was unable to confirm the favourable results previously claimed. The reactions, supposedly of an allergic nature, were observed, but could not be correlated with the existence of the relative parasites.

—E. L. TAYLOR.

LÜHRS. (1934). Bekämpfung der Leberegel- und Lungenwurmseuche in den an die See grenzenden Gebieten. VI. Mitteilung. [**Control of Liver Flukes and Lungworms Near the Sea Coast**].—*Arch. wiss. prakt. Tierheilk.* **67.** 377-384. 1 table. [1 ref.]

Lührs gives an account of further observations on the effect of flooding with

sea water the ditches of pastures bordering the sea, and dressing the land with kainit or calcium nitrate for the control of lungworms and liver flukes. The results obtained were very favourable and showed that considerable benefit is to be derived from this procedure.—E. L. TAYLOR.

ANDERSON, C., & GOBERT, E. (1934). Note sur la présence, en Tunisie, de *Schistosoma bovis*. Infection naturelle de *Bullinus contortus*. [**Presence of** *Schistosoma bovis* **in Tunis. Natural Infection of** *Bullinus contortus*].—*Bull. Soc. Path. exot.* **27.** 850-852. [1 ref.]

Anderson and Gobert report on some investigations into the specificity of fork-tailed cercariae found in *B. contortus* in Tunis. By the infection of mice they were able to secure the adult worms and identified them as *S. bovis*, and not *S. haematobium* as had been anticipated.—E. L. TAYLOR.

MILLER, H. M., Jr., & GARDINER, Margaret L. (1934). **Further Studies on Passive Immunity to a Metazoan Parasite,** *Cysticercus fasciolaris*.—*Amer. J. Hyg.* **20.** 424-431. 2 tables. [2 refs.]

The authors have repeated their previous work on this subject and carried out two further experiments. As a result they are able to conclude that the rat can be actively immunized against infection with *Taenia taeniaeformis* and be passsively protected by the transference of serum from immune animals. It has also been demonstrated that immune serum is capable of inhibiting early infections if administered within ten days. The immune properties of the serum were found to vary with the degree of infection of the donor rat, and the serum to reach its maximum protective power ten days after inoculation.—E. L. TAYLOR.

DRABBLE, J. (1934). **Measles (Cysticercus ovis) in Sheep in New South Wales.**—*Aust. vet. J.* **10.** 57-59. 1 fig. [2 refs.]

Several cases of infestation of sheep with *C. ovis* are recorded. In most cases the cysts were degenerated. In one heavily infested case numerous cysts were present in all of the voluntary muscles ; the heart was heavily infested and odd cysts were found in the kidneys. A description of the cysts is given.

—H. McL. GORDON.

KELLER, H. (1934). Versuche und Erfahrungen mit dem abgekürzten Gefrierverfahren zur Tauglichmachung finniger Rinder. [**Rapid Freezing Process for Killing Cysticerci in Beef**].—*Z. Fleisch- u. Milchhyg.* **45.** 65-68. [14 refs.]

Keller reports on practical tests (carried out in abattoirs) of the quick method of freeing beef from cysticercus infection by lowering the temperature and maintaining it at not less than –3°C., in the centre of the thickest muscle, for 24 hours. The results obtained were very satisfactory ; a room temperature of –7°C. was found to lower the meat to the requisite temperature in six to seven days. The shorter period in the cold room was also found to result in a very considerable saving in loss of weight from evaporation, and all the cysticerci were killed. Thawing requires to be done carefully as, if it proceeds too quickly there is some loss of meat juices ; for thawing a temperature of +5°C. is satisfactory.—E. L. TAYLOR.

ZUNKER, M. (1935). Die Abtötung der Rinderfinnen durch Kühl- und Gefrierverfahren. [**The Killing of** *Cysticercus bovis* **by Cooling and Freezing**].—*Z. Fleisch- u. Milchhyg.* **45.** 121-126. 2 figs., 1 table. [13 refs.]

The author's extensive observations on the effect of freezing temperatures (–6·4° to –9·4°C.) upon *C. bovis* in beef show that this method is very efficacious

in killing the cysts if the temperature is maintained for seven days ; 100 per cent. of the cysts are then killed. He is of the opinion, however, that for the ultimate eradication of the parasite it will be necessary to attack it in the human host.

—E. L. TAYLOR.

WETZEL, R. (1934). Untersuchungen über den Entwicklungskreis des Hühnerbandwurmes Raillietina cesticillus (Molin, 1858). [**Investigations on the Developmental Cycle of** *Raillietina cesticillus*, **a Tapeworm of Fowls**].—*Arch. wiss. prakt. Tierheilk.* **68.** 221-232. 5 figs. [16 refs.]

Wetzel here gives a detailed account of his work on the life history of *R. cesticillus*. Feeding experiments with various beetles which occur in Germany showed that at least 13 species were capable of acting as intermediate hosts. All of these belonged to the sub-family Harpalinae, of the family Carabidae, and to seven different genera. The species are as follows :– *Calathus fuscipes*, *C. ambiguus*, *C. erratus*, *Poecilus cupreus*, *Pterostichus niger*, *Pt. nigrita*, *Pt. vulgaris*, *Amara aenea*, *A. familiaris*, *A. apricaria*, *Zabrus tenebrioides*, *Harpalus tardus* and *Bradycellus collaris*. Twenty-seven species belonging to 21 other genera and to six families gave negative results. The development and the morphology of the cysticercoid are described in detail. The infective stage is reached in the intermediate host in from 26 to 31 days and the adult worm develops in the final host in from 16 to 20 days.

The persistence and spread of infection in a flock of fowls depends largely upon carrier birds and upon the successful wintering of the intermediate hosts ; this last factor is thought to be a particularly important one.—E. L. TAYLOR.

ORTLEPP, R. J. (1934). **Echinococcus in Dogs from Pretoria and Vicinity.**—*Onderstepoort J. vet. Sci.* **3.** 97-108. 5 figs., 1 table. [15 refs.]

The author describes worms of the species *E. granulosus* obtained by him from dogs in Pretoria and concludes that there are at least two and perhaps three species of *Echinococcus* in these animals whose description differs from that of *E. granulosus*. Two new species are described, *E. cameroni* and *E. lycaontis*.

—E. M. ROBINSON.

RAMSAY, G. W. St. C. (1935). **Observations on an Intradermal Test for Dracontiasis.**—*Trans. R. Soc. trop. Med. Hyg.* **28.** 399-404. 1 table. [9 refs.]

This paper reports on the application of the intradermal test to the diagnosis of Guinea worm infection in man. The antigen was prepared by drying portions of the worms in a desiccator, powdering them and placing the powder in ether, to remove the lipoid fraction. The solid portions were afterwards filtered off and dried at 37°C. The product was then placed in 0·85 per cent. sodium chloride and maintained at 37°C. for four hours, after which it was sterilized by passage through a No. 6 Seitz filter. No preservative was added, and the antigen was used as soon as possible after it had been prepared.

The test was carried out by the intradermal inoculation in the arm of 0·25 c.c. of the saline extract. The injection raised a weal about half an inch in diameter, and the reaction was considered positive if this increased in size to 2·3 cm. in its greatest and 2 cm. in its smallest diameter, and showed pseudopodia-like projections.

85 per cent. of persons, in whom the Guinea worms were actually visible, gave positive reactions and 84 non-infected persons, from a part of the country in which the Guinea worm does not occur, gave negative reactions. Indications were obtained that the reaction persists for a number of years after infection has ceased, but the test appears to be specific for the Guinea worms, and a useful

aid to diagnosis. It is an interesting addition to the few intradermal tests which have been used for the detection of metazoan parasites in man and in animals.
—E. L. TAYLOR.

HOBMAIER, A., & HOBMAIER, M. (1934). **The Route of Infestation and the Site of Localization of Lungworms in Mollusks.**—*Science.* **80.** 229. [4 refs.]

These two investigators have made some more detailed observations on the infestation of slugs and snails with the larval stages of the lungworm of swine. The larvae are found to enter the muscular foot of the molluscs, particularly in the furrows in the sole. Twenty-four hours later they coil up and a loose connective tissue nodule begins to form round them. They grow considerably during the next few weeks and moult twice, becoming infective for the final host after the second moult.—E. L. TAYLOR.

NEVZAT, A. (1934). Gongylonema bei Schlachttieren in der Turkei und eine neue Art Gongylonema bei Rindern (Gongylonema orientalis bovis). [**Gongylonema in Sheep and Cattle in Turkey**].—*Türk. Baytarlar cemiyeti mecmuasi.* No. 4. pp. 7-22. [Abst. from abst. in *Tierärtzl. Rdsch.* **40.** 860].

The author, who first reported *G. sentatum* in sheep in Turkey in 1922, has made a fuller study of its incidence and also of its morphology. Although he only found this species of the genus in sheep, he found what appears to be a new species in cattle, and to this he gives a trinomial name [so contravening the rules for the naming of a new species].

He found 60 per cent. of 400 sheep and 96 per cent. of 350 cattle to be infected with *Gongylonema* ; as a rule the greater part of the body of the parasite was buried in the mucous membrane and it was observed that the head of each worm was always pointing towards the stomach. The incidence of infection was higher in adults than in young animals.—E. L. TAYLOR.

HAYS, I. M. (1935). **Some Observations on Filariasis and its Treatment.**—*J. Amer. vet. med. Ass.* **86.** 55-63.

A description is given, in very general terms, of a series of trials with intravenous injections of various substances for the elimination of *Dirofilaria immitis* from the dog's heart. Tartar emetic was found to be the most useful drug, but dosage must be high and be frequently repeated for the ultimate eradication of the infestation. Close observation of the microfilariae in the blood is regarded as an important aid to the dosage. As the antimony accumulates in the blood the movements of the microfilariae become slower and at this point a larger dose may be given, after which the microfilariae rapidly disappear. If the injections are discontinued at this period the antimony is rapidly eliminated and the parasites soon regain their normal activity. A dose of 3 c.c. of a 1 per cent. solution was injected intravenously in most instances and was raised to 4 or 5 c.c. when the microfilariae were observed to become sluggish.—E. L. TAYLOR.

LANE, C. (1934). **The Periodicity of Microfilaria Bancrofti.**—*Lancet.* **227.** 1437-1441. [11 refs.]

Lane here replies at length to the several arguments put forward in a recent article by LOW, MANSON-BAHR and WALTERS [this *Bull.* **5.** 223.] who adhere to the view that microfilarial periodicity is to be explained by the microfilariae secreting themselves in some organ during part of the 24 hours.

These authors cited a case in which the blood of the heart, large vessels and lungs was found to be swarming with microfilariae after death from prussic acid

poisoning. They assumed that the flow of blood and lymph immediately ceases at death from prussic acid poisoning and that the distribution of larvae after death in this case represented their distribution during life. In answer to this argument that these are the situations of the microfilariae during the daytime, Lane cites an experiment in which the lymph was observed to flow for some 97 minutes after death from prussic acid poisoning so that *post-mortem* examination after death due to this poison cannot be relied upon to show where the microfilariae are situated in life. He also recalls FÜLLEBORN's work on the embryos of *Dirofilaria immitis*, showing that the numbers of microfilariae in different parts of the circulatory system alter greatly after death, and the work of O'CONNOR, who demonstrated an anatomical condition in the female worms suggestive of periodic parturition. This, Lane considers to be the most probable explanation for the phenomenon.—E. L. TAYLOR.

IWANOFF, X. (1934). Ueber Sommerwunden beim Rinde. **[Summer Sores in Cattle]**.—*Arch. wiss. prakt. Tierheilk.* **67.** 261-270. 3 figs. [7 refs.]

Iwanoff gives an account of the occurrence, aetiology, general appearance and morbid histology of summer sores in Bulgarian cattle. They correspond closely with those which are seen in horses caused by the larvae of species of *Habronema*, being more or less circular sores with a projecting granulating surface some 5 to 30 cm. in diameter. These make their appearance in the early part of the summer and persist until the cold weather comes when they disappear spontaneously, although during the summer they fail to respond to any ordinary wound treatment. *Stomoxys calcitrans* is the carrier of infection and an examination of 780 flies in one town showed 5 per cent. to be infected. Trials with various treatments have shown that the simple protection of the wound from flies is sufficient to bring about healing in a short time. The principal harm results from the damage done to the hide.—E. L. TAYLOR.

IMMUNITY.

CONISBEE, E. G. (1933). **Tuberculosis and the Intradermal Tuberculin Test in the Horse.**—*Vet. Rec.* **13.** 1221.

CONISBEE, E. G. (1935). **Tuberculosis and the Intradermal Tuberculin Test in the Horse. [Correspondence].**—*Ibid.* **15.** 188.

MUNRO, C. (1935). **Tuberculosis and the Intradermal Test in the Horse. [Correspondence].**—*Ibid.* 217.

The characters of the reaction to the double intradermal test in the horse have already been described [SCOTT, F. C. (1931). *Vet. Rec.* **11.** 1306]. Conisbee obtained a hot, painful swelling, which developed with the sensitizing dose, in a 16-year-old horse. The animal was subsequently slaughtered and was said to be affected with a sarcoma of the kidney, although Conisbee doubts the correctness of this diagnosis. [In the past, the neoplastic appearance of tuberculous lesions in the horse has not infrequently led to a mistaken diagnosis of a tumour].

Munro reports a case of a horse suffering from emaciation, chronic diarrhoea and stiff neck, in which a double intradermal test was negative. A *post-mortem* examination revealed very extensive lesions of tuberculosis. [This result is in keeping with the known facts regarding the failure of advanced cases of tuberculosis to react to any test].—R. E. GLOVER.

KFOURI, P. (1935). La tuberculino-réaction cutanée chez l'Homme et chez

l'Animal, au moyen de timbres-tests tuberculiniques. [**Cutaneous Reactions in Man and Animals by Means of Tuberculin Discs**].—*Rec. Méd. vét.* **111.** 30-40.

The nature of the dermal reactions which follow the application of special paper discs impregnated with " old tuberculin " have already been described [MALOU – this *Bull.* **4.** 43, and KFOURI & MALOU, *Ibid.* **5.** 85]. According to Kfouri, this method appreciably increases the precision of the von Pirquet type of test mainly because the tuberculin is held in intimate contact with the cutaneous tissues for a period of from two to four hours. No claim is made that it is equal in sensitiveness to the intradermal test, but the suggestion is advanced that it is particularly useful in following the reactions in infected animals from the preallergic state, through the various stages of allergy, to complete anergy.—R. E. GLOVER.

RUPILIUS, K. (1934). Zum Problem Tuberkulinsensibilisierung des tuberkulin-negativen Organismus. [**Tuberculin Sensitivity of the Tuberculin-Negative Body**].—*Wien. klin. Wschr.* **47.** 420-422. 2 tables. [10 refs.]

Rupilius has attempted to produce in tuberculosis-free guinea pigs a local allergy to tuberculin by the injection of an " old tuberculin "-metacholestrin-olive oil-myricin mixture. In one series of experiments with small doses of tuberculin no sensitization was produced but in two other series, which were tested after a longer interval, occasional local reactions were observed which were perhaps to be regarded as specific. Generally speaking, the reactions increased with increase of the " sensitizing " dose. This produced a definite local reaction at the time of injection.—A. W. STABLEFORTH.

CHAMBAZ, A. H. (1934). Recherches immunologiques sur les substances lipidiques et lipoidiques. Extraites des bacilles tuberculeux tués par la chaleur. Etude de leur pouvoir haptène. [**Immunological Study of Lipoids of the Tubercle Bacillus**].—*Thesis for Docteur vétérinaire, Alfort.* pp. 149. 7 tables. [26 refs.]

The greater part of this thesis is compendious and does not lend itself to abstraction. Part I is devoted to the chemical structure of the tubercle bacillus, with special references to the investigations of GORIS, ANDERSON and MACHEBOEUF, the latter of whose researches [(1934). *Ann. Inst. Pasteur.* **52.** 277.] are given in some detail, since they were the inspiration of this thesis. Part II records the immunological work proper, in which hapten-activity was titrated in terms of fixation of complement.

Briefly, the lipoidal composition of tubercle bacilli, killed by heat, embraces the following primary fractions :– (1) fraction A, an acetone-soluble, phosphorus-free, soft wax of reddish-brown tint that is not present in viable bacilli ; (2) fraction B, soluble in cold alcohol, a rather hard fat of light yellow-orange colour and rich in phosphorus, and (3) fraction C, soluble in warm alcohol, a hard white wax of low phosphorus content. The remaining fractions, D and E, are vitreous substances, soluble in ether and chloroform respectively.

Fraction C possesses, in great degree, the character of acid-fastness and, *in vitro*, exhibits but slight antigenic activity. Fraction B is markedly hapten-like in its behaviour and, *in vitro*, fixes complement in the presence of tuberculous antisera. This property is apparently due to a sub-fraction, B_2, which is a phospho-lipoid complex, devoid of glycerin and insoluble in acetone, but soluble in alcohol, ether and chloroform. The other constituents of fraction B are phosphoric substances slightly ether-soluble, glycerides and lipoids devoid of glycerin. They are not hapten-like in their behaviour.—J. W. EMSLIE.

ALESSANDRINI, A. (1934). Considérations et remarques à propos de la séro-reaction de Wright. [**Observations on the Agglutination Test for Brucella Infections**].—*Boll. Sez. ital. Soc. int. Microbiol.* **6.** 387-399. [46 refs.] [In French].

The author refers to some possible sources of error in the agglutination test for the diagnosis of brucella infections in animals and man. He considers that, notwithstanding its simple technique, it offers many difficulties in interpretation. The cultures employed (*Br. melitensis* and *Br. abortus*) should first be subjected to all the recognized tests and should contain only S colonies.—T. M. DOYLE.

NIELAND, H. (1934). Die Abortus-Bang-Infektion der Milch und ihre Erkennung mit Hilfe der Agglutination (Vergleichende Untersuchungen über Schnell- und Langsamagglutination). [**Diagnosis of *Br. abortus* Infection in Milk; Comparison of the Slide and Tube Agglutination Methods**].—*Berl. tierärztl. Wschr.* **50.** 709-711. 2 tables. [23 refs.]

Nieland has compared the value of the rapid slide method of testing whey for *Br. abortus* agglutinins with the usual tube method. Of 500 whey samples, 332 were negative by both methods, and 53 positive by both. With the remainder the results did not agree, 103 being entirely negative by the slide method and positive by the tube method (tubes 1 : 10 or over). He concludes, therefore, that the slide method cannot be used to replace the tube method, but suggests that its only value is to obtain a quicker result in a certain proportion of cases and to cut down the number to be tested by the tube method. [Other workers have obtained much more satisfactory results with the slide method for detecting brucella agglutinins in whey – see numerous abstracts in this *Bull.* **4.** 326, 419, 757 and others].—A. W. STABLEFORTH.

BIELY, J., & ROACH, W. (1934). **A Comparison of the Routine Rapid Whole Blood (Stained Antigen) and the Routine Rapid Serum Agglutination Tests for Pullorum Disease.**—*Canad. J. Res.* **10.** 798-806. 8 tables. [4 refs.]

Details are given of tests on 4,429 birds, comprising eight flocks, using the whole blood agglutination test and the rapid serum agglutination test for the detection of carriers of *Salmonella* (formerly *Bact.*) *pullorum*. The results agreed in the case of 4,307 birds (97·24 per cent.) and disagreed in 122 birds (2·75 per cent.).

Of the 122 birds, 43 were diagnosed as positive by the whole blood agglutination test and as negative by the rapid serum agglutination test, whilst 79 were diagnosed as positive by the rapid serum agglutination test and as negative by the whole blood agglutination test.

The tests were carried out at two laboratories. It is pointed out that the personal factor in the interpretation of the results of the reaction is most important.

Details of the tests are supplied, and also *post-mortem* findings in some of the birds.—NORMAN DOBSON.

LOVELL, R. (1935). **Studies on Normal Agglutinins. The Agglutination of *Pf. mallei* by Normal Horse Sera.**—*J. R. Army vet. Cps.* **6.** 69-82. 10 tables. [19 refs.]

This investigation follows the same lines as the author's previous study of normal agglutinins for members of the salmonella group [see p. 437].

The sera of 314 normal horses, 5 cattle, 8 pigs, 6 goats and 4 rabbits were all shown to contain *Pfeiferella mallei* agglutinins. In the case of the equine sera the average titre was 1 : 640 with a suspension from one strain and 1 : 320 with another

strain. The agglutinins are specific and are not affected by exposure to a temperature of 56°C. for 30 minutes. A previous mallein test did not affect the titre of the serum. The age of the horses did not appear to influence the titre, but females showed a greater frequency at the higher titres than males.

Agglutination is equally effective in a water bath at 55°C. or in a dry incubator at 37°C.—GWILYM O. DAVIES.

LOVELL, R. (1934). **The Presence and Significance of Agglutinins for Some Members of the Salmonella Group Occurring in the Sera of Normal Animals.** —*J. comp. Path.* **47.** 107-124. 7 tables. [45 refs.]

This study concerns the presence of agglutinins for both " H " and " O " antigens of certain members of the salmonella group in normal animal sera, and is a continuation of previous work [this *Bull.* **3.** 96].

Suspensions were prepared from strains of *Salmonella typhi-murium* (formerly *Bact. aertrycke* or *Bact. enteritidis* Breslau), group, type and " O " suspensions, *S.* (formerly *Bact.*) *newport*, type and " O " suspensions, *S. paratyphi* (formerly *Bact. paratyphosum*) C, type and " O " suspensions and *S. enteritidis* (formerly *Bact. enteritidis* Gärtner), " H " and " O " suspensions, and these were used to determine the presence of agglutinins in normal sera from 263 pigs, 163 bovines, 71 sheep, 40 horses and 40 rabbits. The results of these tests are presented in tables which do not permit of abstraction. They indicate that, with the exception of the rabbit sera, the majority of the sera agglutinated several of the suspensions tested.

Analyses of the results also show the increased frequency of antibodies with advancing age in swine and also of " H " agglutinins in cattle. The sheep, horse and rabbit sera results were not analysed. Sex does not appear to influence the agglutinin content.

Fractional absorption of the sera revealed that the normal agglutinins were specific, both " H " and " O " agglutinins being present.

The author also states that some of the sera agglutinated suspensions of other bacteria covering a wide range, some of the organisms concerned being saprophytic and others entirely parasitic, e.g. *Vibrio cholerae*.

Another important finding made by the author is that he failed to isolate any member of the salmonella group from 144 pigs and 71 sheep, although such animals possessed salmonella agglutinins in their sera. This is rather significant in the light of the prevailing, although disputed, view that several of these species are considered to be normal inhabitants of the intestinal canal.

The author states " that the balance of evidence may be said to show conclusively that true Salmonella bacteria are not natural inhabitants of the animals used for food and that they are not found more frequently than can be accounted for on the supposition that their presence is due to an actual case of disease or the carrier state after infection ".

In view of this, the author proceeds to discuss the significance of the agglutinins which are found in a large proportion of the sera of healthy animals, as it is unreasonable to suppose that all the animals had been infected at one time or another with salmonella bacteria. It is considered that they are most likely due to stimulation by other bacteria normally present in the alimentary canal or tissues which, although not members of the salmonella group, are very closely related antigenically.

—GWILYM O. DAVIES.

ENGARD, P. T. (1934). **Stained Antigen Whole Blood Test for Pullorum Disease.** —*Vet. Alum. Quart.* **22.** 18-22.

The author deals principally with the practical application, on a commercial scale, of the whole blood agglutination test for *Salmonella* (formerly *Bact.*) *pullorum* infection.

He gives very full details of his technique for carrying out this test, particularly with regard to equipment used, method of handling fowls, etc. He obtains the blood by snipping a small piece from the comb, and points out that particular care must be taken when dealing with White Leghorns as these birds bleed very freely.

Reacting male birds were few in number and confined to the heavy breeds, and in every case except one the percentage of reactors was higher amongst hens than pullets.—J. E. WILSON.

BERENZ, L. (1934). Eignet sich die Komplementbindungsmethode zum Nachweis der Eutertuberkulose des Rindes ? [**Demonstration of Udder Tuberculosis by Complement-Fixation**].—*Inaug. Diss. Berlin.* pp. 33. 1 table. [17 refs.]

Berenz made complement-fixation tests with whey and blood from 204 cows (816 quarter samples of milk) drawn from various sources. The whey was filtered and inactivated at 58° to 60°C. for 30 minutes. Two antigens were used, ordinary bovine tuberculin and the acetone-lecithin extract of Beller. The results are given in terms of cows.

The results obtained with whey agreed with those of microscopic examination, *post-mortem* findings or guinea pig inoculation with material from 168 cases, of which 141 showed no evidence of udder tuberculosis by either method, whilst 27 had tuberculosis of the udder. All specimens which gave positive fixation, and in which evidence of udder tuberculosis could not otherwise be found, were inoculated into guinea pigs.

The results disagreed in 36 cases, viz., 33 in which the serological result was positive although no udder tuberculosis could be found, and in three cases where udder tuberculosis was present, but in which the serological result was negative.

No correlation was found between tuberculosis of other parts of the body and a positive whey result, or between the results of whey and blood tests.

—A. W. STABLEFORTH.

HECK, J. (1934). Rapport over de vaccinatie's tegen septichaemia epizoötica in een gedeelte van de onderafdeeling Makale-Rantepao (afdeeling Loewoe ; Gewest Celebes en Onderhoorigheden) in het tweede halfjaar 1933. (Extracten uit de Maand- en Jaarverslagen der Gouvernements en Provinciale Veeartsen, No. 67). [**Vaccination against Haemorrhagic Septicaemia in the Island of Celebes in the Last Half of 1933**].—*Ned.-ind. Bl. Diergeneesk.* **46.** 319-328. 3 tables.

Test vaccination against haemorrhagic septicaemia was performed on about 10,000 buffaloes and 5,600 pigs in a severely contaminated district of the Dutch East Indies. Immediately after vaccination or during the negative phase, six buffaloes and one pig (about 0·5 per 1,000) died. Following this immunization, not a single case of septicaemia occurred during six months while, in the neighbouring control-districts, more than 3 per 1,000 of the buffaloes and swine contracted the disease. Vaccination is a valuable control measure against haemorrhagic septicaemia of cattle and swine. [See also this *Bull.* **5.** 4].

—J. VAN DER HOEDEN (UTRECHT).

VELU, H., & ZOTTNER, G. (1935). Valeur antigénique de Brucella abortus en excipient gras. [**Antigenic Value of** *Br. abortus* **in a Fatty Base**].—*C. R. Soc. Biol. Paris.* **118.** 225-226. [4 refs.]

It has been shown that, in some cases, the injection of organisms incorporated in a fatty base whilst localizing the bacilli does not materially affect their antigenic powers. The authors found that living *Br. abortus* made up in a base consisting of 75 parts of vaseline and 25 parts of anhydrous lanolin will produce in rabbits an agglutination titre of 1 : 1,000 as opposed to a titre of 1 : 2,000 when living bacilli in normal saline are used. It remains to be proved whether the fatty base has removed some of the objections to the use of living *Br. abortus* as an antigen.

—J. A. NICHOLSON.

SCHAEFER, W., & SANDOR, G. (1934). Recherches sur les protéides du bacille tuberculeux et les anticorps antiprotéidiques tuberculeux. [**The Proteins of the Tubercle Bacillus and the Anti-Protein Tuberculous Antibodies**].—*Ann. Inst. Pasteur.* **53.** 72-92. 10 tables. [13 refs.]

The object of the investigation was to discover if the protein extracted from cultures of tubercle bacilli acted as antigens, or whether their antigenic properties depended upon the presence of lipoid impurities in the proteins. The more important findings were as follows :–

It was impossible to extract the proteins of the tubercle bacillus completely free from the lipoid fraction without denaturing the protein. The lipoid and protein fractions produced specific antibodies in rabbits – the antibodies obtained by injection of protein not reacting with the lipoid antigen and *vice versa.* It was possible, by adsorption on fat-extracted bacilli, to separate the protein antibodies of the anti-protein serum from the lipoid antibodies of the anti-protein serum. Intravenous injections of tubercle bacilli in the horse or rabbit produced antibodies against the proteins and lipoids of tubercle bacilli. The quantity of antibodies was variable and never constant. The protein antibodies first appeared and then the titre of the lipoid antibodies began to increase till finally it was much higher than that of the protein antibodies. On stopping the injections, the protein antibodies disappeared more quickly than the lipoid ones. When using anti-BCG serum, however, it was impossible to obtain unilateral adsorption. In cases of tuberculosis in human beings it was found that the protein antibodies were much more common than the lipoid antibodies, but that the quantities varied. The specificity of the protein antigens was also investigated.—JAMES STEWART.

GRONCHI, V., & CONSTANTINI, A. (1935). Recherches sur le pouvoir bactéricide que le sang d'animaux diversement réceptifs aux infections à Brucellae, exerce sur Br. melitensis et Br. abortus. [**Bactericidal Power of Blood on** *Br. melitensis* **and on** *Br. abortus*].—*Boll. Sez. ital. Soc. int. Microbiol.* **7.** 7-11. [8 refs.] [In French].

The authors have tested the bactericidal powers of normal blood (human, bovine, porcine and caprine) on R and S strains of *Br. abortus* and of *Br. melitensis.* The bactericidal powers of the blood of the four species was found to be stronger against *Br. abortus*, R and S variants, than against *Br. melitensis*, R and S variants.

The R variant was less resistant than the S variant, which is contrary to the author's experience with *Salmonella typhi* (formerly *Bact. typhosum*).

—T. M. DOYLE.

EALES, C. E. (1934). **Some Tests on the Bactericidal Properties of Sheep Saliva.** —*J. Coun. sci. industr. Res. Aust.* **7.** 118-119. [1 ref.]

Some tests were carried out to determine whether sheep saliva had any inhibitory or bactericidal properties, since it was thought that it may play some part in the prevention of enterotoxaemia. Fresh saliva was mixed with an equal

volume of physiological saline and filtered, first through a Seitz K and then an L_2 filter. The filtrate was added to liver piece medium in varying proportions up to 50 per cent. When these preparations were inoculated with *Clostridium ovitoxicum*, with *Cl. welchii* and with *Cl. oedematiens* they all showed growth after 24 hours' incubation. It is pointed out that, although negative results were obtained *in vitro*, the possibility remains that saliva may have some effect *in vivo* where conditions must necessarily be very different. [The work of FLEMMING and others on lysozyme appears to have been overlooked ; it has been shown that this antibacterial enzyme does not pass through the filters which were used to prepare the saliva for the above tests].—W. I. B. BEVERIDGE.

FRASER, D. T., JUKES, T. H., BRANION, H. D., & HALPERN, K. C. (1934). **The Inheritance of Diphtheria Immunity in Ducks.**—*J. Immunol.* **26.** 437-446. 6 tables. [6 refs.] [Copied *verbatim* from *Bull. Hyg., Lond.* **9.** 720. Signed by W. W. C. Topley].

The evidence with regard to the occurrence of congenital passive immunity in birds – the transference of antibodies from the hen to the chick *via* the egg yolk – is somewhat conflicting, although there are isolated observations that suggest the existence of such a mechanism. The present paper records a series of experiments that definitely support this view. It was found (1) that ducks responded to the injection of diphtheria toxoid by the production of antitoxin ; (2) that the eggs laid by immunized ducks contained antitoxin in the livetin fraction of the yolk, and that the concentration of antitoxin in the yolk was correlated with the concentration in the hen's serum ; (3) that the serum of newly-hatched ducklings from eggs laid by immunized hens contained antitoxin ; and (4) that no antitoxin could be detected in the serum of three-weeks-old ducklings from the same mothers.

DISEASES, GENERAL.

STILES, F. E. (1934). **Common Ailments of Sheep.**—*J. Amer. vet. med. Ass.* **84.** 51-57.

A brief description is given of the common diseases of sheep encountered by the veterinary practitioner in America, together with the treatments adopted by the author. He lays stress on the importance of a correct diet for lambs and mentions heavy losses resulting from dietetic errors.—F. BLAKEMORE.

JOHNSON, S. D. (1935). **A Report of Observations in a Herd Infected with Mastitis and Bang Abortion Disease.**—*Cornell Vet.* **25.** 54-56. 1 table.

The author describes his findings in agglutination tests for abortion, and clinical examination for mastitis, in a herd of 25 to 30 animals established for four years. Abortions had occurred during the last two years and mastitis had increased during the last year. The latter disease was more prevalent among the negative abortion group in this herd.—C. V. WATKINS.

JANSEN, J. (1934). Tuberculose en paratyphus bij eenden en eenige andere eendeziekten. **[Tuberculosis and Paratyphoid Infection in Ducks and Some Other Duck Diseases].**—*Tijdschr. Diergeneesk.* **61.** 1025-1031. [English, French and German summaries : abst. from orig.]

In an area where 500 fowls were examined and 24·8 per cent. found to be tuberculous, the author found that 34 out of 100 ducks were also infected. In the ducks the intestines were very seldom infected but infection of the liver and

peritoneum was frequent. In a few cases no macroscopic alterations could be found in the organs, although smears from the organs contained many acid-fast bacilli.

Six out of the 100 ducks were suffering from chronic oophoritis with paratyphoid organisms in the ovaries.—J. VAN DER HOEDEN (UTRECHT).

VERGE, J. (1934). Entérocoque et broncho-pneumonie enzootique du porcelet. **[Enzootic Broncho-Pneumonia in Piglets Caused by the Enterococcus].**—*C. R. Soc. Biol. Paris.* **115.** 1494-1495. [5 refs.]

A few references are given of the isolation of an enterococcus from various organs of the body in different animals. The author had the opportunity of studying some deaths in pigs, the only lesion being that of broncho-pneumonia. Cultures were made from the heart blood, hepatized areas of the lung, and bone-marrow and an organism resembling an enterococcus was isolated.

The organism was Gram-positive, non-motile and non-sporulating. Its form was that of a diplococcus in short chains, or that of a bacillus. Numerous cultural reactions are given.

Pathologically, a 24-hour-old Martin's broth culture, injected intraperitoneally or subcutaneously, killed white mice, but it was non-pathogenic to rabbits or guinea pigs. [There is no further evidence that the organism isolated was of primary importance].—N. H. BROOKSBANK.

SCHALM, O. W., & BEACH, J. R. (1934). **The Etiology of a Respiratory Disease of Chickens.**—*Science.* **79.** 416-417. [3 refs.]

This severe respiratory infection in chickens can be transmitted by inoculation with exudate or by contact ; in either case there is a nasal discharge, followed by oedematous inflammation of the periorbital sinuses and purulent conjunctivitis. The infection may spread to the tracheae, bronchi and lungs, with rapid and extreme emaciation.

Smears from the various exudates, stained by Gram's and Giemsa's methods, constantly show a vibrio type of organism and small bacilli, staining in the majority of cases only at the poles. Growth of an organism pathogenic for chickens could only be obtained on blood agar plates, incubated aerobically in an atmosphere containing 10 per cent. CO_2. Smears, after 24 hours' incubation, show a small, rod-shaped, Gram-negative organism with a tendency to form filaments. The vibrio organism has not yet been isolated in pure culture.

An emulsion of a culture of the bacillus inoculated intranasally and intratracheally into chickens, six weeks to six months old, produced typical symptoms in 45 out of 48 cases. Fowls recovered from culture-induced disease were, in most cases, resistant to subsequent inoculation with culture, but were susceptible to inoculation with exudate. This does not indicate that the organism is not the aetiological factor, as infection with the exudate did not always protect against reinoculation with exudate. The authors suggest that the pathogenicity of the organism has been reduced by culture, thus making it incapable of producing a strong immunity.—R. F. GORDON.

I. ARGYLE, E. P. (1933). **The Lesions found in Cases of Roaring.**—*J. R. Army vet. Cps.* **4.** 155-165. 1 plate. [21 refs.]

II. ARGYLE, E. P. (1934). **The Lesions found in Cases of Roaring. Some Further Notes.**—*Ibid.* **5.** 103-109. 7 figs. [8 refs.]

I. The author reviews the literature dealing with lesions of the left recurrent laryngeal nerve of horses suffering from roaring and then proceeds to describe

the actual changes that he has found in this nerve in the course of his own work on the subject. Both anatomical and histological lesions are considered in detail. The lesions of the muscles of an affected larynx and, finally, the condition of the cartilages are then dealt with. The theories of the origin of the disease are reviewed, viz. degenerative changes in the affected nerve ascribable to pressure injury or to the action of toxins or metallic and vegetable poisons. The author suggests that there must be other factors besides the foregoing which have a bearing on the causation of the disease and he indicates lines on which future observations should be made. The article is well illustrated.

II. Following up his previous work on this subject the author gives an account of the lesions that he has found in the medulla oblongata of two horses which were roarers during life. The degenerative changes noted were practically confined to a proportion of the cells of the nuclear area of the tenth nerve, but only on the left side. There is a record of the results of the histological examination of four more left recurrent laryngeal nerves taken from cases of roaring. In one case a section cut near the point of bifurcation from the vagus showed slight degeneration which suggests the possibility of fibres of the main trunk of the vagus being also affected.

The latter half of the article is devoted to a further consideration of factors which may lead to injury of the nerve in its intrathoracic course. The article ends with a note on the use of the rhino-laryngoscope in the study of this disease.

—C. Davenport.

Dehner, O. (1934). " Der Schlafkoller ". Beitrag zur Differentialdiagnose des Hauptmangels " Dummkoller ". [**" Schlafkoller " and " Dummkoller ". Horse Diseases Characterized by Somnolence**].—*Tierärztl. Rdsch.* **40.** 645-648. [3 refs.]

The disease known as " Schlafkoller " [" sleepy staggers "], which occurs in Hesse and the neighbouring districts, is not identical with the cerebral disease " Dummkoller " [disease of horses associated with increase in intracranial pressure]. Confusion between the two conditions is possible through the difficulty of determining the objective symptoms of cerebral affections with somnolence, and on account of the changing picture and frequently existing similarity of symptoms, especially when the examination is not very thorough. The overvaluation of single symptoms frequently leads to faulty diagnosis. According to the author's experience, " Schlafkoller " is usually of longer standing, whilst the hairless patches on the anterior aspect of the fetlock joints of the forelimbs due to stumbling, observed now for the first time in " Schlafkoller ", enable a differential diagnosis to be made. " Schlafkoller " must be considered as a more important, though obscure, disease.—C. R. Turbet.

Kolessow, A. M. (1934). Predwaritelnye dannye o kliniko-gematologitscheskom issledowanii MPS loschadey v Armenii. [**Investigation of a Meningitis of Horses in Armenia**].—*Sovyet. Vet.* No. 4. 51-54. [In Russian]. [Abst. from abst. in *Tierärztl. Rdsch.* **40.** 730-731].

An outbreak of disease characterized by symptoms of a meningitis in horses in Armenia is described. Acute, subacute and latent cases occurred. All types were characterized by an orange yellow tint of the visible mucous membranes due to a hyperbilirubinaemia. This was present three to six days before the onset of clinical symptoms which included oedematous swellings of the dependent parts of the body and limbs. The blood picture was markedly altered, showing an erythrocytosis and a neutrophilia.

This is a preliminary report.—J. E.

LERCHE, & FRITZSCHE, K. (1933). Die Aetiologie der Geflügellähme. [**The Aetiology of Fowl Paralysis**].—*Z. InfektKr. Haustiere.* **44.** 11-42. 1 table. [24 refs.]

An investigation with a variety of diets revealed no possible cause of fowl paralysis. Lameness could be produced by vitamin deficiency, but the condition was quite distinct from true fowl paralysis. No relationship could be demonstrated between the nature of the soil or drinking water and the occurrence of the disease. Lameness is seen in birds heavily infected with coccidia (usually *Eimeria tenella*) or with the tapeworm, *Davainea proglottina*, but neither of these parasites causes the specific disease.

Attempts to spread the disease by contact or by artificial infection gave positive results. With contact experiments, transmission occurred in 20 per cent. of cases. Using artificial means, it proved possible to reproduce the disease in about 50 per cent. of cases, if birds between the ages of eight and 14 weeks were injected with a suspension of nerve tissue or blood taken from affected birds. A proportion of these showed clinical symptoms ; the remainder showed histological lesions only.

Control measures should aim at excluding the disease from clean flocks by introducing birds from clean sources. Affected flocks may be cleaned by the slaughter of infected adults, by breeding from clean birds only and by the segregation of young birds until they are 14 or more weeks old.—E. J. PULLINGER.

DE BOER, E. (1934). Neurolymphomatosis Gallinarum. 2. [**Fowl Paralysis**].—*Tijdschr. Diergeneesk.* **61.** 520-528. 7 figs. [German summary : abst. from orig.] [For abst. of previous article in this series see this *Bull.* **5.** 38].

The author had the opportunity of studying the clinical symptoms in 158 fowls suffering from neurolymphomatosis. In 120, the morbid anatomy could also be studied. The disease was only found in fowls under one year old. Nearly always one or both legs were paralysed. At the onset, paralysis is unilateral and in bilateral cases there was still a difference between the two legs. The sensitivity of the legs decreased or even disappeared totally as well as the reflexes. After this stage of paralysis eye symptoms occurred. The peripheral nervous system showed oedematous swelling and change of colour. In 11·4 per cent. of the cases the author found " tumours ", especially in the cardiac muscle.

—J. VAN DER HOEDEN (UTRECHT).

MEYN, A., & RIEVEL, H. (1934). Beitrag zur Marekschen Geflügellähme. [**Fowl Paralysis**].—*Dtsch. tierärztl. Wschr.* **42.** 832-836. 2 tables. [12 refs.]

The histological examination of 47 cases of fowl paralysis has shown that the occurrence of infiltration of the sciatic nerve is a characteristic lesion of the disease. In the differential diagnosis, parasitic infestations and tumours are conditions of importance. Birds infested with parasites but not affected with fowl paralysis do not show the characteristic changes, whilst true tumours can be differentiated from the swellings of fowl paralysis by differences in the histological structure.

Further evidence is given in support of the hypothesis that this disease is one which is transmitted through the egg, as well as by contact. If these two methods of spread are borne in mind, the reason why curative treatment is contraindicated is clear. Affected birds must be slaughtered, and breeding should only be carried out with stock having no history of the disease.—E. J. PULLINGER.

FINDLAY, G. M., & WRIGHT, Joyce. (1933). **Ocular Lesions in Epidemic Blindness of Fowls.**—*J. comp. Path.* **46.** 139-148. 6 figs. [8 refs.]

The authors discuss the findings of previous workers who have studied ocular lesions in association with fowl paralysis and proceed to give the results of a very full investigation. They carried out a large number of histological examinations of material from birds experimentally affected and from epidemics in various parts of England.

They observed pathological changes in the optic tracts, optic nerves, choroid, retina, iris (most commonly), cornea (rarely) and in the ocular muscles. The infiltrating cells most commonly found were plasma-like cells, small lymphocytes, polymorphonuclear leucocytes, etc.

The relationship of epidemic blindness and fowl paralysis is discussed, the authors bringing forward histological evidence in support of the view that the former is one of the manifestations of the latter. They point out, however, that it is not possible to be absolutely dogmatic on this point until the actual cause of fowl paralysis is determined, as it is possible that there may be two closely allied agents at work.—J. E. Wilson.

Gmelin, W. (1934). Die Beziehungen der Mondblindheit zur Kopfkrankheit. [**Connection between Periodic Ophthalmia and Encephalitis**].—*Berl. tierärztl. Wschr.* **50.** 201-203. [5 refs.]

It is maintained that periodic ophthalmia is merely a peculiar manifestation of encephalitis and that, if satisfactory results are to be obtained, control of the one condition in a stud farm must be carried out simultaneously with control of the other. It is suggested that noxious substances, resulting from infection of the central nervous system, are released into the general system; if these are not destroyed or removed rapidly enough, they reach the eyes where they set up the characteristic inflammatory changes.—E. J. Pullinger.

Simonatti, E. (1934). Febbre catarrale maligna. Osservazioni e considerazioni. [**Malignant Bovine Catarrh**].—*Profilassi.* **7.** 176-182. [15 refs.] [English and French summaries: abst. from orig.]

The author gives his conception of the present knowledge concerning malignant bovine catarrh, pointing out that treatment is most unsatisfactory and that the mortality rate remains high. His observations show that the characteristic symptoms are a sudden rise of temperature, nervous derangement and inflammation of various mucous membranes. These are often masked by complications such as broncho-pneumonia, enteritis, etc. The disease runs an acute or subacute course. It has been suggested that a filtrable virus is responsible [see this *Bull.* **5.** 367]. The complications are possibly caused by secondary invaders such as *Bact. coli*, streptococci, etc.; the incubation period is long. Contrary to statements made by other workers, the author asserts that the disease may occur in very young calves and even in old animals. It has been suggested that sheep act as a reservoir for the virus, but the author could find no evidence that such is the case, nor does he consider that ectoparasites play any part in the transmission of the disease.—J. A. Nicholson.

Benner, J. W. (1933). **Anemia in Young Pigs.**—*Rep. N. Y. St. vet. Coll. 1931-32.* pp. 133-153. 10 figs., 4 tables.

Seventy-two pigs, from 11 sows which were divided into two groups, one of which had been immunized against cholera, were kept under observation for signs of anaemia. Of these pigs, 11 became anaemic, or the haemoglobin fell below 3 g. per 100 c.c. blood. The haemoglobin was determined by the method of Smith and Cohen. Four methods of immunization against cholera were used

among the litters from the immune sows and, from the limited data obtained, the virus-alone method tended to lower the haemoglobin content of the blood. It was found in the litters from the non-immune sows that the smaller the litter the greater was the incidence of anaemia although, again, the numbers were too small for any definite conclusions to be drawn. It was found that the haemoglobin content of normal pig's blood drops from birth for about 21 to 30 days, and then rises again.

From his experimental results, the author concludes that the true cause of pig anaemia has not been discovered ; he attempts to explain it by the theory that infection plays an important part in the development of the disease. He supposes that harmful bacteria are harboured in the epidermis when the young pigs begin to suck, which decrease in numbers until, at the end of about three weeks, they are greatly reduced or disappear. For this reason, he advocates keeping the skin of the sow thin, sleek and clean by good feeding and sanitary conditions. He suggests that iron solutions may act by virtue of their germicidal properties as much as by making good a deficiency.—G. D. Shearer.

Datta, S. C. A. (1935). **Effects of Sterility and Impotence on Breeding Operations in India and Methods for their Diagnosis and Control.**—*Indian vet. J.* **11.** 160-163.

The author states that sterility is a cause of loss to dairy farmers in India and that with the adoption of intensive methods this loss is expected to become serious. The many possible causes of the condition are briefly outlined and in diagnosis mention is made of the examination of the semen.

Brief reference is made to various methods of treatment including massage of the ovaries, the use of minerals, wheat germ oil, potassium iodide and endocrine products.—W. J. Ironside.

—. (1934). Reichsverband der deutschen Tierärtze in der čsl. Rep. Bekämpfung der Sterilität der Rinder. [**Campaign against Bovine Sterility in Czechoslovakia**].—*Prag. tierärztl. Arch.* **14.** 226-229 and 266-267.

In this article the common causes of bovine sterility are recapitulated. It is emphasized that control of sterility can only be effected by control of the causal factors.—E. J. Pullinger.

Clapp, H. (1934). **Cystic Ovaries and Twinning in Holsteins.**—*Cornell Vet.* **24.** 309-324. 7 tables.

This study of the breeding records of a herd of 150 pure-bred Holsteins over a period of six years has shown a relationship between the occurrence of ovarian cysts and twin pregnancy. Of 24 cases of cystic ovaries, 9 (37·5 per cent.) conceived twins ; these included 6 out of 11 (54·5 per cent.) cows served within 35 days of the rupture of the last cyst, whereas only 3 out of 13 (23 per cent.) of those served after a longer interval conceived twins. This is contrasted with the 3·1 per cent. occurrence of twins among all other conceptions. A tendency to cystic ovaries is probably not inherited, but it follows high production. There may be inheritance of twin-bearing among cattle, but the conclusions of past studies may require modification, since they did not allow for the association between the occurrence of cystic ovaries and twin pregnancy brought to light by these studies. The disadvantages of twin pregnancies are pointed out and recommendations for their avoidance are made.—R. F. Montgomerie.

Küst. (1934). Frühabort des Rindes. [**Early Abortion in Cattle**].—*Dtsch. tierärztl. Wschr.* **42.** 439-444. [15 refs.]

Among the causes of abortion in cattle, the author mentions displacement of the corpus luteum of pregnancy and non-specific infections due to various bacteria. Dietetic factors also play a part and instances of abortion due to the following causes are known :– calcium and phosphorus deficiency, excessive feeding with soya bean meal, and the feeding of earthnut cake contaminated with mustard seed. In one herd where the author proved the absence of *Brucella abortus* infection, it was found that a number of abortions were caused by ensilage, while in another the cause could be attributed to the feeding of mouldy lucerne hay. The role of trichomonad infection in the causation of abortion and sterility is stressed. The disease is usually conveyed to cows during service by an infected bull and may cause vaginitis with failure to conceive or an endometritis with early expulsion of the foetus. As a rule abortion is accompanied by a purulent discharge in which the parasites may be demonstrated. In combating the disease the author recommends that no cow should be served for six to eight weeks after abortion and then only after careful examination for the presence of disease. Bulls should be examined for inflammatory lesions around the prepuce and all infected animals should be isolated from the rest of the herd.—S. J. Edwards.

Grzycki, S. (1934). Badania nad skladem krwi i miesni w hemoglobinemji porazennej u koni. [**Examination of the Composition of the Blood and Muscle in Equine Myoglobinuria Paralytica**].—*Rozprawy Biol.* **12.** 1-28. 8 tables. [25 refs.] [Abst. from French and German summaries].

In equine myoglobinuria paralytica there is a rise in the blood sugar, creatin, creatinine and blood phosphorus. Lactic acid is increased to a smaller extent. In addition, there is an increase in residual nitrogen, a lowering of the alkali reserve and a reddening of the serum with considerable amounts of haemoglobin or myoglobin ; creatinine and phosphate are present in the urine, the sediment of which also contains blood corpuscles.

All these abnormalities are checked and reversed by an insulin injection, and the clinical condition improves correspondingly.

The author is of the opinion that the cause of this disease is a disturbance of the glycolytic process in the muscles, which is secondary to a plethoric condition succeeded by muscular exertion.—J. E.

Marcenac. (1934). Le radio-diagnostic dans les affections du squelette chez le cheval. [**X-Ray Diagnosis in Skeletal Diseases in the Horse**].—*Rev. vét. milit.* **18.** 177-199. 3 text figs., 6 plates. [2 refs.]

This paper opens with a review of the earlier experiments and observations which finally led Röntgen to his discovery of X-rays. The gradual evolution of the X-ray tube is then discussed, and the merits and demerits of the various types reviewed. Particular reference is made to Philips' portable outfit for use in veterinary practice, and details are given regarding its use. Typical exposures with an ultrarapid film are 2 to 4 seconds for the shin, 5 seconds for the foot, and 12 seconds for the head. Some excellent reproductions of radiograms are given representing normal joints, osteomata, sarcomata, fractures and osteoporosis. These were chosen from cases passing through the Army Veterinary School at Saumur.—Henry Dryerre.

Strauss, M. B., & Maddock, S. (1934). **The Relation of Increased Intra-Abdominal Pressure to the Liver Lesions of Eclampsia.** [**Dog**].—*Amer. J. Path.* **10.** 821-825. [11 refs.]

The theory revived by THEOBALD [(1932). *J. Path. Bact.* **35.** 843.] that hepatic lesions of the eclamptic type are due to increased intra-abdominal pressure, is criticized on the grounds of experimental evidence. The authors suggest that the lesions produced experimentally, both by THEOBALD and themselves, simply represent hepatic necrosis due to chloroform anaesthesia.—J. RUSSELL GREIG.

GRATZL, E. (1934). Die Klinik und pathologische Anatomie der Blinddarmverstopfungen des Pferdes. [**Symptoms and Pathology of Caecal Obstruction in the Horse**].—*Wien. tierärztl. Mschr.* **21.** 583-592 and 616-625. 3 figs., 3 tables. [22 refs.]

A previous article by Gratzl on the pathogenesis of impaction of the caecum of the horse has already been abstracted [this *Bull.* **5.** 230].

The two accounts now under consideration deal with the clinical and pathological-anatomical aspects of the disease. The difference in outlook from the English point of view is very considerable and, to be appreciated, the original articles should be consulted. For his statistical enquiry, the author deals with 6,063 cases of colic during the ten years 1923 to 1932, of which 658 were due to impaction of the caecum. The seasonal incidence does not vary greatly; it gradually increases, however, with the age of the patient up to between 16 and 20 years. The clinical material consisted of about 400 cases and 40 abattoir preparations. The *post-mortem* appearances are described in detail, considerable attention being paid to the thickness of the wall of the caecum at its head, body and apex. The pathognomonic increased thickness of the muscular layers is due to physiological hypertrophy. The clinical picture is given in detail, special attention being devoted to rectal examination. It is stated that impaction of the lobe, the head and the whole organ are easily recognized. Differential diagnosis is briefly considered. The author does not approve of the use of the term " chronic " impaction of the caecum in contra-distinction to the acute form. He prefers to call it " habitual ". Treatment is not discussed.—A. W. N. PILLERS.

TORREY, J. P., THORP, F., Jr., & GRAHAM, R. (1934). **A Note on Pathological Changes Encountered in Wild Ducks.**—*Cornell. Vet.* **24.** 289-298. 5 figs., 1 table.

An outbreak of disease affecting wild ducks in the neighbourhood of a pond on an island in Illinois river was investigated. The symptoms during life included a hesitancy to take wing, and slow or short flights that terminated suddenly in a rapid descent.

Examination of eight ducks found dead showed them to be affected with pneumomycosis and autopsies on several ailing birds, together with subsequent tests, revealed that they were affected with lead poisoning due to the ingestion of lead shot.

Numerous microfilaria were present in the blood of the ducks, but they were not identified and no significance was attached to their presence.

—J. E. WILSON.

I. WELLS, W. F. (1934). **On Air-borne Infection. Study II. Droplets and Droplet Nuclei.**—*Amer. J. Hyg.* **20.** 611-618. 4 tables, 2 charts. [2 refs.]

II. WELLS, W. F., & STONE, W. R. (1934). **On Air-borne Infection. Study III. Viability of Droplet Nuclei Infection.**—*Ibid.* 619-627. 1 fig., 3 tables. [2 refs.]

I. Air-borne infection may take one or two forms, depending upon the size of the infected droplet. The most obvious form is simple droplet infection and

this applies to droplets of mouth spray larger than 0·1 mm. which are removed from the air by gravity before they evaporate. The second form is true air-borne infection and concerns droplets of less than 0·1 mm. diameter. Such droplets are usually evaporated in the course of a 2 m. fall, subject to slight variations depending on the atmospheric conditions, and they remain suspended as droplet nuclei and are conveyed for long distances by air currents. True droplet infection is localized and concentrated whereas air-borne infection, due to dried droplets, is dispersed and diluted.

II. In this paper, experimental evidence is brought forward to show that organisms can remain viable for long periods when attached to droplet nuclei or dried droplets. Some organisms were recovered and cultivated from the atmosphere four days after atomization. This retention of viability permits very wide dissemination.—GWILYM O. DAVIES.

MASON, J. H., & BEKKER, J. G. (1934). **Further Notes on Lumpy Wool in South Africa.**—*Onderstepoort J. vet. Sci.* **3.** 211-216. 1 fig., 1 table. [3 refs.]

Actinomyces dermatonomus was isolated from two cases of lumpy wool in merino sheep. The organism corresponded to that described by BULL as the cause of lumpy wool in Australian sheep. Lesions were produced experimentally in rabbits, guinea pigs and mice by rubbing infected material into the scarified skin. Typical cases in sheep were produced by the same methods, using cultures or infected wool. Treatment with a mixture of tincture of iodine in linseed oil was very successful in early cases, but not in advanced ones.—E. M. ROBINSON.

I. STÅLFORS, H. (1934). Osteomalacikomplexet. [**Osteomalacia Complex**].—*4. Nord. Vet.-mötet. Helsingfors, 1933.* pp. 223-238. 2 figs. [6 refs.] [English summary : abst. from orig.]

II. SVANBERG, O. (1934). Osteomalacikomplexet. [**Osteomalacia Complex**].—*Ibid.* 238-267. [5 refs.] [English summary : abst. from orig.]

I. Under the title " skravel-sjuka " (" pine "), with a number of synonyms, there occur in Sweden several deficiency diseases or, more correctly, slightly differing inanition disturbances in the metabolism in cattle. " Skravel-sjuka " is often considered to be identical with osteomalacia, but it presents many differences, and the author prefers to speak of it as making a part of the osteomalacia complex. The disease is found throughout Sweden, but most frequently in Dalcarlia, certain parts of Värmland and Norrland, and it is the cause of extensive losses annually. As regards the cause, there is no doubt that the character of the fodder and the soil plays a dominant role. An insufficient supply of easily digestible carbohydrates, of lime and phosphoric acid and albumin may be the most prominent causes. As regards treatment, amongst other methods, a change of fodder and, in cases of hypoglycosaemia, administration of easily digestible carbohydrates (sugar) are recommended.

II. In his contribution to this subject, the author especially deals with a specific disease called " mjölkhalta " [" milk-lameness "] which occurs in cows in Sweden, chiefly in the province of Småland. This deficiency disease has the character of an actual osteomalacia or, more correctly, an aphosphoric osteomalacia corresponding to the " stiff-sickness " studied by THEILER in South Africa. The disease may be combated prophylactically by better cultivation of the land and proper manuring, especially with superphosphate.

—GUSTAV NAERLAND (FARSUND).

MACKAY, Helen M. M. (1934). **Dietetic Deficiencies and Susceptibility to Infection.**—*Lancet.* **227.** 1462-1466. [24 refs.]

The paper represents a general discussion upon iron deficiency and avitaminosis, with special reference to the relation between dietetic deficiencies and susceptibility to disease.—J. RUSSELL GREIG.

MILLS, R. H. (1934). **Calf Losses due to Iodine Deficiency.**—*J. Amer. vet. med. Ass.* **85.** 645-652. 3 figs., 2 tables.

Attention was called to certain losses in calves in the Hat Creek section of eastern Shasta County in the northern part of California. It was found that many calves had been born prematurely and that retention of the placenta was of common occurrence in the breeding cows in the herd. It was shown that these occurrences were not due to *Brucella abortus* infection and, since many of the calves developed goitre, it was considered that the condition was associated with an iodine deficiency. Very satisfactory results were obtained by the administration of iodized salt, which was prepared by mixing 2·3 lb. of potassium iodide with each 1,000 lb. of common salt.—J. RUSSELL GREIG.

HART, L. (1934). **Cannibalism in Fowls Associated with a Deficiency of Animal Protein in the Diet.**—*Aust. vet. J.* **10.** 23-25. [1 ref.]

A description is given of two outbreaks of cannibalism in poultry associated with protein deficiency. In one, ten birds out of 150 had died. The dead birds had bled freely from the cloaca before death. At *post-mortem* examination, the chief features noted were severe mutilation of the cloaca and the posterior portion of the oviduct. In the other, two out of 21 birds died. At *post-mortem* examination it was found that almost the whole of the small and large intestines had been torn out. The diets consisted of bran, pollard and a small amount of a commercial concentrate, of a doubtful value, in the morning, and wheat and green feed in the evening. The addition of 4 per cent. meat meal to the ration led to the immediate cessation of mortality. Although cannibalism was not directly observed, the lesions at *post-mortem* examination and the spectacular results following the addition of meat meal to the ration, supported by the observations of MALKE [(1930). *Dtsch. tierärztl. Wschr.* **39.** 623.], justify the conclusion that the mortality was due to cannibalism induced by a deficiency of animal protein in the diet.—H. McL. GORDON.

PUBLIC HEALTH.

I. PÉRÈS, G. (1933). L'histoire d'une toxi-infection due au bacille d'Aertrick. [**Food Poisoning caused by** *S. typhi-murium*].—*Bull. Soc. Sci. vét. Lyon.* **36.** 362-367.

II. ROCHAIX, & COUTURE. (1933). Expertise bactériologique dans une epidémie de toxi-infections alimentaires. [**Bacteriological Test in Some Cases of Food Poisoning**].—*Ibid.* 368-380. [1 ref.]

I. An account is given of an outbreak of food poisoning in the town of Valence. Thirty-seven cases were recorded, two of which were fatal. The causal organism was *S. typhi-murium* (formerly *Bact. aertrycke* or *Bact. enteritidis* Breslau) and the vehicle of infection, pie made with veal and pork and jellied with products of veal and pork bones.

II. The bacteriological findings of the outbreak are recorded. The causal organism was not isolated from the two fatal cases, although the blood serum of

four convalescents agglutinated it to relatively high titres. *S. typhi-murium* was isolated from a portion of the meat and jelly of a pie, by direct methods and also by inoculation through one mouse and one of the guinea pigs inoculated or fed with the material.—R. LOVELL.

MIESSNER, H., & KÖSER, A. (1934). Entenei und Lebensmittelvergiftungen. [**Duck Eggs and Food Poisoning**].—*Dtsch. tierärztl. Wschr.* **42.** 717-720. 1 fig., 1 table. [15 refs.]

After a party, a number of guests suffered from diarrhoea, fever and general weakness ; *Salmonella typhi-murium* (formerly *Bact. aertrycke* or *Bact. enteritidis* Breslau) was recovered from their stools. The suspected food was a pudding dressed with eggs, some of which were duck eggs. Eight eggs from the same ducks were examined and one was found to be infected with the organism. The ducks appeared normal, and bacteriological examination of their droppings failed to reveal the presence of *S. typhi-murium*. Blood tests, however, showed four out of five ducks to have a weak titre against the organism. These four ducks were later killed and examined, and two of them showed degenerative and cystic changes in the ovary, from which lesions the *Salmonella* was cultured.—NORMAN HOLE.

BELLER, K., & REINHARD, H. (1934). Ueber das Vorkommen von Bakterien der Paratyphusgruppe in Enteneiern. [**Paratyphoid Bacteria in Duck Eggs**]. —*Berl. tierärztl. Wschr.* **50.** 226-228. 1 table. [13 refs.]

From 34 different duck farms, 1,566 eggs were examined and 14 strains of paratyphoid bacteria isolated. Seven strains were *Salmonella typhi-murium* (formerly *Bact. aertrycke* or *Bact. enteritidis* Breslau) and seven *Salmonella enteritidis* (formerly *Bact. enteritidis* Gärtner) ; one of the latter strains is stated to correspond to the Kiel type which is identical with the Dublin type of this country. The strains of *S. typhi-murium* were isolated from three different farms and *S. enteritidis* from four.—R. LOVELL.

POHEN, C. (1934). Zur Frage der Beurteilung der mit Fleischvergiftern behafteten Kälber. [**The Meat Inspection Decision on Gärtner Infection of Calves**].— *Z. Fleisch- u. Milchhyg.* **45.** 2-5 and 45-48. [11 refs.]

No meat from the carcass of an animal which has been suffering from a salmonella infection should be passed as fit for human consumption.

KAUFFMANN states, however, that there exist pathogenic and non-pathogenic types of *Salmonella* and that those found in calves are always of the latter type.
—E. J. PULLINGER.

PLATE, G. (1934). Die Anwendung serologischer Methoden bei der Markenmilchuntersuchung. [**Use of Serology in Milk Inspection**].—*Dtsch. tierärztl. Wschr.* **42.** 768-771. 5 tables, 1 chart. [3 refs.]

Plate is definitely of the opinion that, in the control of milk supplies, group sampling and clinical inspection should be replaced by the examination of milk from each cow. In the Rhineland provinces, the examination is now carried out as follows :– a rapid whey agglutination test for brucella, followed by the ordinary tube test and culture and guinea pig inoculation in positive or doubtful cases ; a sediment test and microscopic examination, and cultural test for mastitis streptococci and *Br. abortus*, and finally, complement-fixation tests for antibodies to *Mycobact. tuberculosis*, followed by guinea pig inoculation in all positive or doubtful cases.

Using these methods from April to July, 1934, 4·1 per cent. of 2,781 cows

were detected as excreting *Br. abortus*, as against 0·77 per cent. of 12,890 in the previous 15 months, when their detection depended upon group sampling, followed by individual sampling only when the group sample was positive. Analysing the 1934 results further, it was found that the number of samples from which brucella were obtained increased from 16 per cent. when the whey titre was under 1 : 10 to 84 per cent. when it was over 1 : 80. Of the total number of samples from which brucella were obtained, guinea pig inoculation detected about 90 per cent. and cultural tests 27 to 70 per cent. in successive months. Centrifuge deposit gave more positive results than whole milk or centrifuge cream.

—A. W. STABLEFORTH.

STOCKMAYER, W. (1933). Kulturelle Untersuchungen über die Ausscheidung von Bangbazillen mit der Milch. [**Cultural Tests for *Br. abortus* in Milk**]. —*Z. InfektKr. Haustiere.* **44.** 105-128. 6 tables. [9 refs.]

The question is studied of finding a suitable selective medium for the culture of brucella from milk of infected cows. Liver agar, containing an admixture of brilliant green or gentian violet, proved satisfactory. The former dye was found to act most satisfactorily in a concentration of 1 : 500,000, the latter in concentrations between 1 : 50,000 and 1 : 250,000. Using such a medium, it was possible to judge the extent to which a sample was contaminated with brucella by making colony counts. Centrifuge deposit proved the best type of inoculum and cream obtained by centrifugation was the second best ; gravity cream or whole milk were of little value. In the examination of one cow it was found that fore-milk contained comparatively few organisms, more were present in mid-milk, but most in the final strippings. When quarter samples from a cow were examined at calving and daily thereafter, it was found that very marked variations in count occurred from day to day but, in general, the counts were high for about four days, after which they fell rapidly. Four healthy cows were inoculated twice with living cultures of brucella ; subsequently, three of these excreted small numbers of organisms on odd occasions for at least six weeks. The fourth did not excrete the organisms. Of four infected animals similarly inoculated, one showed a subsequent increase in the number of organisms excreted ; the others showed no change. Milk samples from eight cows, showing blood agglutinin titres of 1 : 25,000, were examined culturally on several occasions. Of these, two excreted brucella continuously, five occasionally and one not at all.—E. J. PULLINGER.

SCHERN, K. (1934). Ueber das Verhalten von Blutkörperchen-, Tierkohle- usw. – Suspensionen in roher und erhitzter Milch. [**Behaviour of Blood Corpuscles, Animal Charcoal, etc., in Raw and Heated Milk**].—*Dtsch. tierärztl. Wschr.* **42.** 723-725. [16 refs.]

In 1930, Schern and GORLI reported that, when a large drop (about 0·06 c.c.) of a 1·5 per cent. suspension of guinea pig red cells was mixed with 1 c.c. of fresh bulk milk in a tube of 15 mm. diameter and placed in a water bath at 37°C. for two hours, a rose-red or red ring formed at the cream layer. If the milk had been boiled or heated to 70°C. momentarily, a red deposit with thick edges formed, whereas, if the milk had been held at or near 63°C. for half an hour (holder process), a red deposit with thin and often ragged edges formed, accompanied by a slight reddish ring at the cream layer. It is believed that, if no ring is formed, the milk has been heated over 63°C. Schern now points out that these differences in behaviour, which are simulated by those of animal charcoal, only apply to mixed milk, and not to that of individual cows ; nor do they apply to goat's, human or mare's milk. The peculiar property of cow's milk is believed to rest in the larger size of its fat globules.—A. W. STABLEFORTH.

THERAPEUTICS.

TRAUTWEIN, K., WEISSHAUPT, A., & WAGNER, H. (1934). Erfahrungen mit der Entozonbehandlung in Galtbeständen. [**Treatment of Mastitis with "Entozon"**].—*Dtsch. tierärztl. Wschr.* **42.** 736-742. 3 tables.

Of 326 cows, affected with streptococcal mastitis to various degrees, which were treated by the infusion of " entozon " by the teat canal, 81·2 per cent. were free from infection at the conclusion of treatment on two to five occasions. The percentage varied from 30 to 100 in different herds. In all, 856 quarters were treated, of which 85·6 per cent. were freed from infection : 580 quarters were free after one or two infusions (examination not usually carried out until after the second), whilst a further 128 were free after three infusions, a further 16 after four and a further nine after five infusions. Most cows were treated towards the end of lactation by filling the quarters with 1 : 1,250 " entozon " in distilled water and leaving in for four minutes, followed by thorough and frequent stripping. The milk yield was usually approaching the normal again within eight to 14 days, but marked variations were noted.

Of 164 animals which have calved three months to one year since the treatment, 28 have again shown mastitis streptococci. Owing to bad hygienic conditions on many farms, it is not possible to say what proportion of these are recrudescences of the original infection and what proportion are new infections.

—A. W. STABLEFORTH.

SCHWETZ, J. (1934). Sur l'efficacité de la Gonacrine dans la theilériose à *Th. parva*. [**The Efficacy of " Gonacrine " in** *Th. parva* **Infection**].—*Bull. Soc. Path. exot.* **27.** 23-27. [5 refs.]

This paper records the experimental treatment of three calves with " gonacrine ". One calf had a mixed infection with *Babesia bigemina* and a theileria, and the other two a pure theileria infection exhibiting blue bodies. Two animals died and one recovered, but the author does not consider that the recovery should be ascribed to the treatment with " gonacrine ".—U. F. RICHARDSON.

PERLA, D. (1934). **The Protective Action of Copper against** *Trypanosoma equiperdum* **Infection in Albino Rats.**—*J. exp. Med.* **60.** 541-546. 1 table. [7 refs.]

Experiments are recorded in which copper sulphate, in amounts equivalent to 0·2 mg. per rat per day, and iron ammonium citrate were added to the diet of white rats for ten days prior to inoculation with *T. equiperdum*. When doses of 100,000 trypanosomes or more were given, there was no essential difference between the rats on the copper diet and the controls. When doses of 10,000 trypanosomes were given, 75 per cent. of the rats fed on copper failed to develop any obvious evidence of infection and, with doses of 2,000 trypanosomes, none of the rats fed with copper or iron developed infection ; with the former all the controls succumbed to trypanosome infection, and with the latter dose 48 per cent. developed infection.

—U. F. RICHARDSON.

EICHHOLTZ, F., & ERHARDT, A. (1934). Wirkungsbedingungen des Fuadins bei der Opisthorchiasis der Katze (Kombinationen mit Emetin, Wismut und Quecksilber). [**Value of " Fouadin " in Opisthorchiasis of Cats (Combination with Emetine, Bismuth and Mercury)**].—*Arch. Schiffs- u. Tropenhyg.* **38.** 524-534. 8 tables. [15 refs.]

" Fouadin " alone in doses of 0·1 c.c. per kg. body weight kills *Opisthorchis*

in the cat. Combination with emetine was found to be contraindicated, as the anthelmintic effect of the " fouadin " appears to be reduced. A bismuth combination also appears to lower the efficacy of the " fouadin ". A combination with mercury results in an inhibition of egg-laying by the worms, but does not appear to kill them.—E. L. TAYLOR.

MAROTEL, BOUCHET, JONQUIÈRES, PÉCASTAING, & RIGAUDIÈRES. (1934). Traitement par voie sanguine des strongylo-cylicostomoses larvaires. [**Intravenous Treatment for Larval Strongyles**].—*Rev. vét., Toulouse.* **86.** 559-565.

The authors have experimented on the effect of intravenous injections of " stovarsol " for the destruction of larval strongyles and cylicostomes in the tissues of the horse. The drug was injected in doses of 5 g. repeated three, five, seven or ten times. Its effect was estimated by examination of the larval worms at *post-mortem* examination, and by observations over a prolonged period on the approximate number of eggs in the faeces.

The experiments showed " stovarsol " to be safe in the doses used, but the observed effect upon the parasites was only of such a nature as to indicate that it had some parasiticidal action upon the larvae.—E. L. TAYLOR.

KLOTZ, J. D. (1934). Ueber den Wert des Tetrachlorkohlenstoffes als Anthelminthikum beim Hunde in Verbindung mit Kohle. [**Value of Carbon Tetrachloride combined with Charcoal as an Anthelmintic for Dogs**].—*Inaug. Diss. Berlin.* pp. 31. 1 table. [42 refs.]

Successful results have been claimed for the use of charcoal with such anthelmintics as santonin and oil of chenopodium and the author has carried out experiments with carbon tetrachloride used in the same way. He found that although the anthelmintic action remained good the toxicity of large doses was considerably reduced when this adsorbing agent was used.—E. L. TAYLOR.

BAQUÉ. (1934). Contribution à l'étude des véhicules nouveaux pour produits antiparasitaires. [**New Vehicles for Parasiticides**].—*Rev. vét. milit.* **18.** 441-445. [12 refs.]

The author recommends the use of sulphonated terpene alcohol in place of soft soap or washing soda in the preparation of parasiticide dressings.

It is easily miscible with water and quite large doses are not toxic for the dog. A solution of 1 : 200 in water, sprayed on, wets the coat well, and only a small quantity of the diluted solution is needed, 1·5 litres for a horse.

It has been used with various parasiticides.—W. J. IRONSIDE.

BAUDET, E. A. R. F., & DE BOER, E. (1934). De bestryding van runderhorzellarven met Derris-extracten. [**Campaign against Ox Warble Larvae with Derris**].—*Tijdschr. Diergeneesk.* **61.** 974-983. 1 table. [English, French and German summaries : abst. from orig.]

Further investigations [this *Bull.* **4.** 774.] have shown that watery solutions of derris powder in a dilution of 1 : 30 give results similar to the usual concentration (1 : 10). These watery extracts are sometimes more active than commercial preparations of derris, such as " derrilavol " and " abdassol ". Rotenone, an ingredient of derris, is also very useful in the following mixture :– 10 g. rotenone dissolved in 250 c.c. of acetone and 4 litres of a 2 per cent. soap solution, freshly prepared.—J. VAN DER HOEDEN (UTRECHT).

HALDIN-DAVIS, H. (1935). **Treatment of Simple Inflammation of the Skin (Dermatitis).**—*Brit. med. J.* Feb. 16th. 289-291.

In the treatment of superficial sepsis the most important principle is the avoidance of irritant dressings. Antiseptics employed must be highly diluted. Oily preparations are better than watery ones both for cleansing and dressing.

In the treatment of eczema, protection against friction, contact, or evaporation is of first importance, hence the usefulness of fatty substances, particularly soft paraffin. Protection must be borne in mind in the selection of agents for incorporation with the base. Equal parts of ung. zinci B.P. and paraffinum molle is a good standard ointment. Where stimulation is necessary, agents such as salicylic acid, or liq. picis carb. may be added to the standard ointment. The use of X-rays is of very great value.—W. J. Ironside.

Faust, E. C., & Kagy, E. S. (1934). **Studies on the Effect of Feeding Ventriculin, Liver Extract and Raw Liver to Dogs Experimentally Infected with Endamoeba histolytica.**—*Amer. J. trop. Med.* **14.** 235-255. 3 tables. [7 refs.]

The 19 dogs used for the experimental treatment were infected by the intracaecal inoculation of a strain of human *E. histolytica*, the results being judged by a comparison of the course of the disease in them with that in 94 untreated controls. " Ventriculin " was administered to five dogs in doses of 20 g. daily for five or six days, treatment commencing some ten to 14 days after the inoculation. In all cases the dysenteric symptoms and emaciation became more pronounced and four of the five animals died. Histopathological examination revealed a degree of secondary involvement rarely seen in untreated dogs.

Liver extract was used in doses of 100 g. daily in the treatment of five dogs, treatment commencing about a fortnight to three weeks after inoculation. The animals under treatment improved in condition and dysenteric faeces gave place to formed stools which, however, still contained blood-stained mucus and amoebae, though these were sluggish, devoid of ingested erythrocytes and sometimes encysted. *Post-mortem* examination revealed that in most situations repair was proceeding well and was occasionally supplemented by a covering of true epithelium.

Two dogs were treated by feeding with 400 g. of raw liver about three months after the inoculation of amoebae. One animal died but exhibited attempts at repair of the amoebic lesions, the only amoebae found being dead or moribund. The other animal appeared to make a complete recovery and on *post-mortem* examination the only evidence of disease was the presence of healed lesions in the rectum. Seven animals were fed with raw liver on the seventh, fourth and last days prior to inoculation. Four of these animals died and three recovered spontaneously. The efficacy of liver feeding seems to consist of its action on the tissues which the amoebae attack. It is suggested that the tendency of liver to neutralize histamine and other protein degeneration products may aid healing and reduce the risk of bacterial invasion.—U. F. Richardson.

Stanton, J. E. (1934). **Sodium Hyposulphite in Cane (Hydrocyanic Acid) Poisoning. A Prompt Specific, used Intravenously.**—*Vet. Med.* **29.** 437.

Following a severe drought, the author was called upon to treat a number of cases in which cattle had been poisoned by various varieties of sorghum. Those cases which were reached before breathing had ceased were given 40 to 80 c.c. of a 20 per cent. solution of sodium hyposulphite and always recovered.

—J. A. Nicholson.

McCoy, J. (1934). **Disinfection by Electricity.**—*Med. Offr.* **52.** 7-8.

A machine for disinfecting clothing by electric dry heat is described. The

period of treatment is half-an-hour at 240°F. This kills non-sporing organisms. Anthrax spores may require four hours to be killed. Cotton, woollens, silks and leather goods are undamaged. The cost of working is small.—A. W. N. PILLERS.

POISONS AND POISONING.

STEYN, D. G. (1934). **Plant Poisoning in Stock and the Development of Tolerance.**—*Onderstepoort J. vet. Sci.* **3.** 119-123. 1 table. [2 refs.]

A series of experiments was carried out on rabbits to see whether a tolerance could be developed to the " gifblaar " plant (*Dichapetalum cymosum*). The leaves of the plant were collected in a very young stage, air-dried and ground. A difference in susceptibility to the plant was noticed in different animals. The author concludes that no tolerance is developed after eating the leaves or underground stems and that the active principle of " gifblaar " has cumulative effects. Some animals appear to become sensitized to the plant.—E. M. ROBINSON.

STEYN, D. G. (1934). **Recent Investigations into the Toxicity of Known and Unknown Poisonous Plants in the Union of South Africa.**—*Onderstepoort J. vet. Sci.* **3.** 125-130. [1 ref.]

Fourteen species of suspected plants were tested for their toxicity. Three of them, *Epaltes alata*, *Homeria pura* and *Albuca* sp. were found to have toxic properties. A further species, *Zygophyllum foetidum*, could not be properly tested as insufficient material was obtainable.—E. M. ROBINSON.

BRAIN, C. K. (1934). **The Weeds and Poisonous Plants of Southern Rhodesia.** —*Rhod. agric. J.* **31.** 779-791. 4 figs.

The author deals with the spread and control of the more important classes of noxious plants found in the country. Such plants cause considerable losses by crowding out the more useful plants, adding to the cost of labour, harbouring insect and fungus pests and, in some cases, poisoning animals and human beings. In any country where cultivation is practised, the unwanted plants usually consist of a few native plants and a large number of common weeds introduced from other countries. A number of grasses have been shown to produce prussic acid, the most important of these being the various sorghums.—J. A. NICHOLSON.

CLAWSON, A. B. (1934). **Stock-Poisoning Plants and their Study.**—*Cornell Vet.* **24.** 190-201.

This is an account of some of the more common plants which are poisonous to stock in America. Some interesting statistics are given of losses which may occur under certain peculiar conditions from owners allowing stock to graze pastures heavily infested with poisonous plants. A few traditional treatments for poisoning are condemned, notably indiscriminate drenching with potassium permanganate solutions. The author then discusses poisoning by various plants, too numerous to mention.—G. D. SHEARER.

MARAIS, J. S. C., & RIMINGTON, C. (1934). **Isolation of the Poisonous Principle of *Dimorphotheca cuneata* Less.**—*Onderstepoort J. vet. Sci.* **3.** 111-117. 1 fig. [4 refs.]

The toxic substance in the plant *D. cuneata* has been identified as the cyanogenetic glucoside " linamarin " or acetonecyanhydrin glucose ether. The plant

contains the enzyme " linamarase ". There appeared to be a diurnal variation in the amount of HCN in the plant. An improved method of extraction is described.
—E. M. ROBINSON.

EMMEL, M. W., SANDERS, D. A., & HENLEY, W. W. (1935). **Crotalaria spectabilis Roth Seed Poisoning in Swine.**—*J. Amer. vet. med. Ass.* **86.** 43-54. 4 figs., 1 table. [8 refs.]

Five hogs were fed 2 g. of ground crotalaria seed per day and ten hogs 0·5 g. per day. All the animals lost condition and were killed at varying times before death took place from poisoning. The *post-mortem* and histological findings are recorded in detail. The most characteristic finding was a severe anaemia. A natural case of crotalaria poisoning in a sow was cured by drenching with 10 mg. copper sulphate and 10 mg. ferric ammonium citrate per day.—G. D. SHEARER.

DOEGLAS, A. (1934). Vergiftiging door Mimosa Invisa Mart. [**Poisoning by *Mimosa invisa* Mart – Buffaloes**].—*Ned. -ind. Bl. Diergeneesk.* **46.** 151-160. 3 tables. [English and German summaries : abst. from orig.]

The author was called upon to investigate sudden illness amongst buffaloes. Two animals were found dead and four others were suffering extreme pain and were killed. *Post-mortem* examination revealed haemorrhages in various organs, but bacteriological examinations were negative and poisoning was suspected. The only suspected plant available was *Mimosa invisa* Mart, which is used as green manure on rubber plantations and which was thought to be harmless to livestock. On feeding 5 kg. of this plant mixed in hay to a buffalo, toxic symptoms developed in about 12 hours. The animal suddenly collapsed, lay on its side, the respirations became shallow and rapid, the temperature rose a few degrees and the animal showed signs of extreme pain. On *post-mortem* examination, haemorrhages were found on the mucous membrane of the rumen, on the surface of the liver and kidneys and in the splenic capsule. Parenchymatous degeneration was found in the liver, spleen, kidneys and heart muscle, and the lymphatic glands were oedematous and contained blood-stained gelatinous fluid. The juice expressed from the leaves of the plant and hot water extracts were also proved to be toxic. The minimal fatal dose of fresh leaves for buffaloes was found to be 10 g. per kg. body weight, and for sheep and goats 50 g. per kg. body weight ; 13 g. per kg. body weight did not injure a bullock.—J. A. NICHOLSON.

—. (1934). **Datura stramonium (Thorn Apple) [Poisoning by].**—*Vet. Rec.* **14.** 1103-1104. 1 fig.

This is a short discussion on thorn apple poisoning in various animals. A description of the plant is given and a short account of the findings of various workers on the subject.—G. D. SHEARER.

WILLSON, V. A. (1934). **Toxic Properties of Greasewood.** [*Sarcobatus vermiculatus*].—*J. Amer. vet. med. Ass.* **85.** 76-81. 2 tables. [3 refs.]

The toxic properties of greasewood are attributed to the oxalates which it contains. Analyses of greasewood leaves for oxalates were carried out, and it was found that the percentage, calculated as sodium oxalate, increased from May to October from 1·89 per cent. to 4·37 per cent. on wet weight basis. From these figures, the author concludes that a sheep would be fatally poisoned after a good feed of greasewood containing 1·89 per cent. sodium oxalate. Sheep are more susceptible to its poisonous action when kept off food and then turned out on a field barren of all foliage except greasewood. This they explain by the fact that

all other food contains a certain amount of calcium which combines with the oxalates in the greasewood, forming insoluble calcium oxalate, which passes through the gut without being absorbed.

The physiological action of oxalic acid and its soluble salts is discussed. When oxalates are absorbed they combine with the calcium of the blood forming insoluble calcium oxalate. This reduces the calcium content of the blood and also throws a great burden on the kidneys.

It is suggested that the best treatment would be administration of lime-water *per os*, so encouraging the formation of calcium oxalate.—G. D. SHEARER.

DEAN, A. T. (1935). **Mottled Enamel in Cattle.**—*Publ. Hlth Rep., Wash.* **50.** 206-210. 4 figs. on 1 plate, 1 table. [13 refs.]

The author describes in detail the findings of VELU and his collaborators on " darmous " in North Africa, which is caused by fluorine in the drinking water from phosphate areas.

On examination of the skulls of 12 range cattle from an abattoir in West Texas, four were found to have teeth with mottled enamel. It is suggested that dairy cattle may, by the continued ingestion of water containing appreciable amounts of fluorine, secrete milk with a high fluorine content and so increase the intake of fluorine by children in an endemic area.—G. D. SHEARER.

SCHOOP, G. (1935). Massenvergiftung von Silberfüchsen. [**Poisoning of Silver Foxes by a Woodwork Preservative (" Xylamon ")**].—*Dtsch. tierärztl. Wschr.* **43.** 7-8.

A large number of deaths occurred amongst silver foxes, following external spraying of the foxes with " xylamon " combined with internal dosage with worm capsules. " Xylamon " is a woodwork preservative for use when cleansing pens infested with ectoparasites ; it is not recommended for external use. Chemical examination of the worm capsules revealed that these contained no abnormal constituents. Experiments in which laboratory animals were sprayed with " xylamon " produced no deaths. It is thought that poisoning was due to the combination of the external treatment with the course of treatment for worms.

—E. J. PULLINGER.

PHYSIOLOGY.

PIERRE. (1934). A propos du mécanisme de la déglutition. [**Mechanism of Deglutition**].—*Bull. Soc. Sci. vét. Lyon.* **37.** 180-186. 1 fig. [13 refs.]

The author has studied oesophageal peristalsis in the horse, dog and rabbit by means of fistulae and the introduction of artificial boli or an oesophageal sound. The latter was provided with a rubber bulb at one end and the other end was connected to a manometer. In the horse, an artificial bolus introduced into the oesophagus remained stationary until it was carried away by a normal swallowing movement. The rubber bulb had to be distended to a pressure of 6 to 10 cm. hg. before peristalsis began. If the movement of the bulb down the oesophagus was prevented, the peristaltic movements died away. In the dog and rabbit, slight distention of the bulb was sufficient to cause peristalsis. The author concludes that oesophageal distention always throws out of gear an oesophageal wave at the point of distention, and that the oesophageal reflex is simple and independent of deglutition.—J. A. NICHOLSON.

ROSS, I. C. (1934). **The Passage of Fluids through the Ruminant Stomach. II.**

With Observations on the Effect of Long Starvation on Anthelmintic Efficiency.—*Aust. vet. J.* **10.** 11-23. 16 tables. [6 refs.]

In a previous paper [this *Bull.* **3.** 49.], the author concluded that the most important factor influencing the course taken by fluids through the stomach, was the period of starvation to which sheep had been subjected prior to drenching.

In the present series of experiments, larger numbers of animals were used, and the determination of the question whether sheep had or had not been starved was more exactly controlled and correlated with the volume and nature of the rumenal and abomasal contents. The volume of abomasal contents after 24 and 48 hours' starvation was not significantly different from that of unstarved animals. It was found that, in groups of sheep starved for a period of 48 hours, the bulk of the water administered as a drench on a given day may or may not pass direct to the abomasum in the majority of cases. The findings in a group of sheep on a single day are not necessarily any indication of the average tendency. Contrary to previously published findings, there was no indication that the period of starvation influenced the passage to the abomasum of water administered as a drench. The administration of copper sulphate solution had a marked influence in securing the direct passage of all, or a considerable part, of the fluid to the abomasum. The difference in the efficiency of copper sulphate solution and water in ensuring direct passage was statistically significant in all cases, whether the animals were unstarved, starved for 16 to 24 hours, or starved for 48 hours.

In view of the fact that the copper sulphate passed to the abomasum in as high a percentage of cases in animals starved for 16 to 24 hours as in those starved for 48 hours, it is not considered that any benefit would be gained by prolonging the period of starvation beyond 16 to 24 hours, in so far as anthelmintic efficiency is dependent on the passage of this drug direct to the abomasum. So far as the volume of the abomasal content is concerned, it is improbable that starvation would markedly influence anthelmintic efficiency in individual animals.

Experiments with two small groups of sheep gave no indication that prolonging the period of starvation beyond the 16 to 24 hours led to any increase in the anthelmintic efficiency of copper sulphate against *Haemonchus contortus*. There was, however, some indication that anthelmintic efficiency was slightly higher in starved than in unstarved sheep.

It is considered that the anthelmintic efficiency of copper sulphate may be largely due to its ability to pass in solution direct to the abomasum in a high percentage of cases, and that the use of this solution as a vehicle may make possible the direct passage of other drugs to the abomasum, with a consequent increase in efficiency against such small or large bowel parasites as *Trichostrongylus* spp., *Oesophagostomum columbianum* and *Chabertia ovina*.—H. McL. Gordon.

Grau, H. (1934). Die Innervation der Gliedmassen des Pferdes. [**Innervation of the Limb Muscles of the Horse**].—*Arch. wiss. prakt. Tierheilk.* **68.** 355-367. 5 figs. [24 refs.]

The nerve supplies of the muscles of the fore and hind limbs of the horse are described. For all practical purposes nearly all the information given can be obtained from any of the standard text-books on anatomy of the domesticated animals, such as that of Bradley, " Topographical Anatomy of the Horse " (3 Vols.), whom the author does not mention, Sisson, " Textbook of Veterinary Anatomy ", or Ellenberger and Baum.—J. R. M. Innes.

Turner, C. W. (1934). **The Functional Individuality of the Mammary Glands**

of the Udder of the Dairy Cow.—*Res. Bull. Mo. agric. Exp. Sta.* No. 211. pp. 51. 11 figs., 13 tables. [34 refs.]

With the aid of a specially designed milking machine unit capable of delivering the secretion of each quarter of the cow's udder into a separate container, a study of the yield and composition of the milk secreted by individual quarters has been made. Data from 45 cows with 74 lactation records of varying length are presented. In general the trend of milk secretion by the individual quarters is uniform throughout the lactation cycle. The fore quarters each produce rather more than 20 per cent. and the rear quarters rather less than 30 per cent. of the total milk yield. On this basis a symmetry index of the udder is proposed. The relative production of the quarters is maintained in successive lactations.

These facts are taken to indicate that the most effective agent in the regulation of the rate of decline of milk secretion with the advance of lactation is the lactogenic hormone.

There was no tendency for the milk of the fore quarters to have a higher fat percentage than that of the rear quarters. Only when the milk yield of one individual quarter declined rapidly as a result of abnormal environmental conditions was any increase observed in the fat percentage of the milk of one quarter above that of the others.—S. J. Edwards.

Keller, K. (1934). Ueber das Verhalten des Chorions bei der Zwillingsträchtigkeit des Pferdes. [**The Arrangement of the Chorion in Twin Pregnancy in the Horse**].—*Wien. tierärztl. Mschr.* **21.** 453-456. 1 fig. [7 refs.]

This is an anatomical study of the arrangement of the chorion in a twin pregnancy. One twin was born alive and weighed 37 kg. ; the other, stillborn, weighed 26 kg. The membranes of the one foetus filled the whole of one horn and most of the body of the uterus. Those of the smaller foetus filled the other horn but the portion of the chorion common to both foetuses was invaginated into the larger chorionic sack.—E. J. Pullinger.

Curson, H. H. (1934). **Studies in Sex Physiology. XI. The Relationship between a Corpus Luteum Verum and the Corresponding Pregnant Horn.**—*Onderstepoort J. vet. Sci.* **3.** 133-134. 4 figs. [1 ref.] [For abst. of previous articles of this series, see this *Bull.* **5.** 158].

These studies were carried out on merino sheep and it was found that in twin pregnancies migration of an ovum from one ovary to the opposite horn might occur. In two cases out of 36 the foetus was found in the opposite horn from the ovary from which the ovum had come.—E. M. Robinson.

Raynaud, R. (1934). Sur l'antagonisme fonctionnel entre les hormones ovariennes. Mécanisme de l'avortement folliculinique. [**Functional Antagonism between Sexual Hormones**]. pp. 170. 15 figs. on 6 plates, 6 tables. [134 refs.] Algiers : Imprimerie Minerva. [8vo].

The author gives a short account of the part played by the ovary in regulating the sexual cycle, and the discovery, isolation and chemical composition of oestrin and progestin. Previous work has suggested that their actions are antagonistic and, in order to clarify this point, experiments were carried out on guinea pigs and rabbits. Standardized oestrin crystals were used. Using the Loeb technique for the recognition of an active corpus luteum, it was found that the subcutaneous injection of oestrin inhibited the reaction. In rabbits, injections of oestrin prevented the complete proliferation of the uterine epithelium induced by progestin. The injection of oestrin into pregnant rabbits was always followed by abortion, provided

that large doses were used, especially in the early stages of pregnancy. It appeared that massive doses of oestrin were capable of producing a condition in rabbits very similar to menstruation in primates. The author is satisfied that oestrin neutralizes the luteinizing action of progestin and *vice versa*, but that the relative quantities of the hormones play a large part in these reactions.—J. A. Nicolson.

Köst. (1934). Ueber Sexualhormone bei den Haustieren. [**The Sexual Hormones of Domestic Animals**].—*Berl. tierärztl. Wschr.* 50. 734-741. 2 tables, 5 charts.

The sexual hormones govern the whole course of the sexual cycle both in man and animals. The anterior pituitary gland produces prolan which acts as the organizer of the sexual rhythm. On the development of a Graafian follicle, oestrin is produced and the ripening ovum stimulates the formation of a corpus luteum. The corpus luteum hormone, progestin, causes the proliferation of the uterine mucous membrane, the continuance of pregnancy and the development of the mammary gland. A male hormone is recognized from the fact that testicular material injected into capons stimulates the growth of the comb.

The Aschheim-Zondek test is inapplicable to domestic animals, but the Allen-Doisy test, i.e. the recognition of oestrin in the urine, is an accurate test for pregnancy in the mare after the 7th week. In cows, oestrin is not excreted until the 23rd week, and in goats not until the 3rd month of pregnancy. In pigs, oestrin is present in the urine from the 23rd to the 30th day when its excretion stops and does not reappear until the 11th week of pregnancy. Hormones cannot be recognized in the urine of pregnant sheep. In each case the secretion of oestrin stops immediately after parturition.—J. A. Nicholson.

Evans, H. M., Lepkovsky, S., & Murphy, Elizabeth A. (1934). **Vital Need of the Body for Certain Unsaturated Fatty Acids. IV. Reproduction and Lactation upon Fat-Free Diets.**—*J. biol. Chem.* **106** 4[illegible]-[illegible]. 3 tables. [8 refs.]

It was found that normal gestation in the rat on a diet free from the essential unsaturated fatty acids was not possible. The gestation period was prolonged and the weights of the young at birth were much below normal. Suckling did not occur. Inadequacy of vitamin E was not the cause, nor were vitamins A and D limiting factors. When the essential unsaturated fatty acids were added, a marked improvement in all the abnormalities was effected.

Lactation was possible, but not highly successful, on a fat-free diet — the essential unsaturated fatty acids — all the known vitamins, and the weights of the young at weaning were below normal. Addition of butter fat made good the deficiency and gave normal weights at weaning compared with controls on a diet of natural foodstuffs.—G. D. Shearer.

Evans, H. M., Lepkovsky, S., & Murphy, Elizabeth A. (1934). **Vital Need of the Body for Certain Unsaturated Fatty Acids. VI. Male Fertility on Fat-Free Diets.**—*J. biol. Chem.* **106.** 445-450. 4 figs. on 1 plate. 1 table. [3 refs.]

Twenty-five male rats were divided into two groups, one without and the other with the essential unsaturated fatty acids in their diets. Once between five and six months old each rat of both groups was offered an oestrous female on five successive nights and next morning careful search was made for spermatozoa in the female.

The rats on the complete diet were all fertile and histologically their testes were normal. All but one of the group on the fat-free ration were sterile but

when given [illegible] vegetal fats they became fertile within 15 weeks after the addition to their diet.—G. I. SHEARER.

ANDERSON [illegible] (1933). **The Calcium Content of the Cerebro-Spinal Fluid in Normal Pregnancy and in Eclampsia.**—*Brit. J. exp. Path.* **14.** 155-159. 2 tables. [1 refs.]

The author has already found that a very large percentage of cases of eclampsia showed a subnormal serum calcium value, and decided to estimate the calcium content of the cerebrospinal fluid in the hope that variations in concentration might throw some light on the occurrence of convulsions. In 27 cases of normal pregnancy the calcium content of the C.S.F. ranged from 4·3 to 6·2 mg., with an average value of [illegible] mg. per 100 c.c. In the 16 cases of eclampsia investigated, the calcium content ranged from 4·1 to 5·9 mg., with an average value of 5·3 mg. per 100 c.c., [illegible] within the normal physiological limits, and showing no abnormal variation which could be connected with the occurrence of convulsions. In the course of the investigation, the average calcium content of the C.S.F. of infants a few days old, who had convulsions, was found to be 6·5 mg. per 100 c.c. compared with a normal value of 5·2 mg. per 100 c.c.—JAMES STEWART.

SERGENT, Ed., & SERGENT, Et. (1934). Expérience d'adjonction de phosphates au régime alimentaire de bovins algériens. [**Trials of Addition of Phosphates to the Ration of Algerian Cattle**].—*Arch. Inst. Pasteur, Algér.* **12.** 339-402. 1 fig.

The addition of bone meal to the rations of cows gave an increase in weight when compared with controls not receiving the bone meal. The experiment extended over 13 months, but the cost of the treatment exceeded the increased value of the animals.

In another experiment, the administration of bone meal and salt increased the milk yield, but the number of animals dealt with (four) was too small from which to draw conclusions.—HENRY DRYERRE.

MARTIN, C. [illegible] PRICE, A. W. (1934). **Studies on the Phosphorus Requirements of Sheep. The Effect on Young Merino Sheep of a Diet Deficient in Phosphorus but Containing Digestible Proteins and Vitamins.**—*Bull. Coun. sci. industr. res. Aust.* No. 77. pp. 44. 9 figs. on 2 plates, 4 text figs., 20 tables. [47 refs.]

This was a very thorough investigation of the effects on young merino sheep of a diet containing a minimum of phosphorus but adequate in good proteins and other components. The low phosphorus diet consisted mainly of wheat straw, a specially made gluten biscuit, potatoes and common salt. Complete data concerning the chemical composition of the diet are given; these include the amount of the various amino-acids, the vitamins and the energy in calories. Five lambs, six months old, and four sheep, one year old, were kept for 11 months on this diet, which contained only 0·6 g. of phosphorus per day. A similar lot was kept on a diet adequate in phosphorus, consisting of the same ration plus 1 g. of phosphorus daily in the form of dicalcic phosphate. The Ca : P ratio in the ration of the former was 4 : 1 and of the latter 1 : 7. Both these lots received 5 c.c. of cod liver oil daily. Also three lambs, eight months old, were placed on the low phosphorus diet for eight months and two other similar groups received, in addition, calcium carbonate sufficient to bring the Ca : P ratio to 10 : 7. One of these latter two groups received cod liver oil, but the other did not.

The same amount of protein biscuit and potatoes was eaten by all sheep

throughout the experiment, but the consumption of roughage by the animals on the low phosphorus diet declined. All the animals remained in good health, but two of those on the low phosphorus diet became incapable of sustained exercise. The lambs receiving 0·6 g. of phosphorus daily gained 60 per cent. of the weight gained by lambs receiving 1·6 g., and the results with the sheep were very similar. Lambs on the low phosphorus diet with a Ca : P ratio of 10 : 7 both with and without cod liver oil gained about 50 per cent. of the weight gained by lambs on the low phosphorus diet with a Ca : P ratio of 4 : 5. The inorganic phosphorus in the blood of lambs and sheep on the low phosphorus diet fell to about 2·5 mg. per 100 c.c. of blood, while that of lambs and sheep receiving sufficient phosphorus rose to about 7 mg.

Phosphorus balance determinations were also carried out. One ewe receiving 1·6 g. of phosphorus, and one receiving 0·6 g. of phosphorus each raised a lamb. Although the lamb of the latter weighed only 75 per cent. of that of the former, and increased in weight at 80 per cent. of its rate, it was healthy and its skeleton was well formed and mineralized. There was no difference in the quantity and quality of wool grown by the lambs on the low phosphorus diet as compared with that of lambs receiving sufficient phosphorus. Anatomical, histological and chemical investigations of the bones of lambs and sheep were carried out at the termination of the experiment. A moderate to severe degree of osteoporosis and osteomalacia was revealed in the lambs that had been on the low phosphorus diet, and one of them showed rickets. Their bones, however, were the same length as those of the lambs which had received adequate phosphorus.

—W. I. B. Beveridge.

Sheldon, J. H. (1934). **The Mineral Basis of Life.**—*Brit. med. J.* Jan. 13th. 47-53. 1 fig. [59 refs.]

This is an extremely interesting account of the chemical elements which have been found to be present in body fluids and tissues, and their approximate concentration, special stress being laid on the less commonly recognized ones.

Among the halogens, the author mentions the variation from normal of blood bromine in cases of maniac depressive psychosis, the mottling of teeth by relatively small amounts of fluorine, and the effects of thyroid diseases on the blood iodine. Of the alkali metals, an account is given of the distribution of lithium, rubidium and caesium in vertebrates and invertebrates. The distribution of copper and its metabolism is discussed at length, and the relation of chronic copper poisoning to haemochromatosis is considered ; mention is also made of the antagonism between calcium and manganese in metabolism. The question of the needs of the body for zinc, silver, arsenic, cadmium, lead and tin is discussed and the relationships between the metals, especially the antagonism between Ca and Mg, and the synergism of Ca and Fe. The account of mineral deficiency is confined to Cu and Fe and the anaemias. The possibility of the different effects of isotopes in biology is discussed in the light of the newly discovered " heavy " hydrogen which does not support life.—G. D. Shearer.

Dann, W. J. (1934). **The Transmission of Vitamin A from Parents to Young in Mammals. IV. Effect of the Liver Reserves of the Mother on the Transmission of Vitamin A to the Foetal and Suckling Rat.**—*Bio-chem. J.* **28.** 2141-2146. 3 tables, 1 chart. [3 refs.]

Thirty-eight piebald doe rats were divided into two groups A and B. Both groups received a small but sufficient amount of vitamin A in the ration throughout the experiment but, four weeks before mating, group B received a ration containing

a much larger amount of vitamin A than previously. After mating, group B was replaced on the original diet.

The young were allowed to grow until they were 18 days old, when they and their mothers were killed and the livers examined for vitamin A. The results obtained show that the vitamin A reserves of the mothers of group A were generally much lower than those of group B ; those of group A ranging from 750 to 18,750 B.U., and group B from 560 to 73,500 B.U. The results are somewhat scattered, but this is explained by the fact that some animals may exert a choice between the various articles of the diet, and so ingest more vitamin A than others.

The vitamin A content of the young rats was roughly related to the vitamin A reserves of the mother, the size of the litter seemingly having no effect on the vitamin A content of the individual young rats. Compared with the vitamin A reserve of the mother, that of the young rat is very small indeed, and the author concludes that, under the conditions of the experiment, if the mother's reserve was 1,000 B.U., each young rat would be likely to store 10 B.U., and if it was 50,000 B.U., that in the young rat would be only 40 B.U.—G. D. Shearer.

TECHNIQUE.

Carpentier. (1934). Les prélèvements de produits pathologiques chez le Cheval. **[The Provision of Samples of Pathological Material from the Horse].**—*Rec. Méd. vét.* **110.** 476-484.

This article is an account of the procedure for the preparation and submission of pathological specimens from the horse, for the guidance of veterinary officers of the French army in their dealings with their military veterinary laboratory. The recommendations made follow accepted lines and the article contains nothing new. Blood smears, serum, pus, skin scrapings, faeces, exudates, sections of tissues and long bones are all considered and the correct method of preparation and despatch of each is given in detail. The diseases are mentioned in the diagnosis of which each specimen is of value.—C. Davenport.

MISCELLANEOUS.

—. (1935). **Equine Pregnancy Diagnosis Service.**—*Vet. J.* **91.** 39-42.

From over 2,000 samples of urine tested during the year, only 48 were doubtful at the first test ; on retesting with a second sample of urine a definite result was usually obtained. During the early part of the season, a considerable number of pregnant mares from about the 55th to the 80th day after service gave weak positive reactions. This is considered to be due to the exceptionally dry summer. The majority of mares do not excrete a sufficient amount of oestrin in their urine to enable the test to be reliable until after the 60th day of pregnancy. It has been shown recently that the Brown Leghorn capon may be used as a test animal as well as the mouse. In this case, on injection of equine urine containing oestrin the growing breast feathers change from black to a salmon colour. Blood serum can also be used to determine pregnancy from the 40th day after service.

—J. A. Nicholson.

Dale, H. (1934). **Chemical Ideas in Medicine and Biology.**—*Science.* **80.** 343-349.

This is a popular address given on the occasion of the opening of the new

research laboratories of the American pharmaceutical firm Eli Lilly and Co. It is chiefly an interesting survey of the wide progressive changes which have taken place during the past 40 years in the science of therapeutics. The recognition of infections as due to the invasion of the body by living micro-organisms, and that other diseases may be due to the lack of substances normally present in the body, without which its normal development and normal functions cannot proceed, has presented us with an imposing list of new types of scientific remedies :– antitoxic sera ; bacterial vaccines and antigens ; artificial chemical antagonists to different infections ; hormones, which the healthy body can manufacture itself, and vitamins, which it obtains ready-made, or as raw material for its own further elaboration from natural foodstuffs.

The more recent research work mentioned in the address concerned the tremendous advance made in our knowledge of the chemical structure of vitamins and hormones, and how it is becoming established that these substances of such great physiological importance, but of such diverse physiological action, are possessed of a common central chemical structure. The important work already carried out on the causation of skin cancer by means of injections of coal-tar products, and the transmission of these growths from chicken to chicken in the same manner as virus diseases, can also be correlated to vitamins and hormones, since these coal-tar products possess the same basic chemical structure. Another chemical product, which may play a still more important role in the elucidation of many physiological problems yet unravelled, is acetylcholine, which is intimately bound up with the chemical transmission of nervous effects. Thus do pathology, immunology and physiology come more and more under the discipline and stimulus of chemical ideas.—James Stewart.

OFFICIAL AND OTHER REPORTS.

Nigeria. (1934). **Annual Report of the Veterinary Department for the Year 1933.** [Henderson, W. W.] pp. 15. 3 tables. Lagos : Govt Printer. [fcp] [1s. 6d.]

This report covers the work of the Veterinary Department in Nigeria during the year 1933. There is no report on research work, the only laboratory work done being serum and vaccine production. During the year there was an increase of 248,358, as compared with the previous year, in the numbers of animals actively immunized against rinderpest ; altogether 476,458 were treated, making a total of 1,581,060 cattle actively immunized since 1927. There were also 584,515 cattle immunized against blackleg, 35,346 against contagious bovine pleuro-pneumonia and 8,268 against anthrax ; 18,707 cattle were treated for trypanosomiasis.

The results of the measures taken have been that, although these diseases still exist throughout Northern Nigeria, there is a great reduction in the losses which formerly occurred. The situation will also probably soon be improved by the measures initiated by the French authorities in West Africa [see Curasson, this *Bull.* **5.** 101].

There is an essential difference between the methods adopted to suppress rinderpest in Nigeria and those taken by the authorities in French West Africa. The French adopt a policy of attempting, as far as possible, to suppress all outbreaks of this disease as they occur by police measures and the use of vaccine or serum, avoiding, unless circumstances are exceptionally safe for the prevention of the spread of this disease, the method of active immunization adopted in Nigeria, which necessitates the continual maintenance of the virus of rinderpest. The situation in the

two areas possibly suits the method used in each. CURASSON states that the average annual mortality throughout French West Africa from rinderpest is only 1 to 1·5 per cent. of the total cattle population, whereas in Nigeria it is stated that the mortality in the serum-virus method of immunization amounts to 1·5 per cent. of those inoculated, a remarkably low figure in such work. In Nigeria, however, there is now a very large proportion of immune cattle (either as a result of a natural attack or by active immunization) and losses in individual herds rarely exceed 20 per cent. in an untreated outbreak, or an average of about 11 per cent. in infected herds when the whole herd is given the active immunization treatment. This is in contrast to the herds of trade cattle from French territory, which almost invariably consist of from 80 to 90 per cent. of animals susceptible to rinderpest. The consequence is that these animals enter Nigeria where rinderpest, although wide-spread, is now treated by cattle owners with some contempt, and in a short time become infected and suffer heavy losses. This situation has led to co-operation between the authorities of French West Africa and Nigeria to control the traffic in trade cattle and reduce losses, both amongst these animals and also any of the remaining cattle susceptible to rinderpest in Nigeria.

Of other diseases dealt with in Nigeria, contagious bovine pleuro-pneumonia is of major importance. It is in fact a greater problem than rinderpest in the east of Northern Nigeria, i.e., in the Lake Chad area. Trypanosomiasis is prevalent throughout Northern Nigeria but has not the same importance as in parts of East Africa, as there is a very definite degree of resistance in all cattle and horses of Nigeria to the common parasite, *Tryp. vivax*. Among horses and donkeys the only other disease of any importance, apart from trypanosomiasis in the horse, is epizootic lymphangitis. Rabies was diagnosed in 16 dogs, one cat and two men. Other diseases commonly met with among dogs are piroplasmosis and distemper. Helminth infestations are very common in all animals throughout Nigeria, particularly among livestock of the settled and semi-nomadic people.

—JEFFREY A. GRIFFITHS.

HOLLAND. (1934). Verslag van de Werkzaamheden der Rijksseruminrichting 1933. **[Report of the Imperial Serum Institute for 1933]**. [LOURENS, L. F. D. E.] pp. 86. 9 tables. The Hague : Algemeene Landsdrukkerij. [8vo] [Fl. 1].

Reports on special investigations are given, in addition to the numerous sections on the results of special diagnosis in connection with animal diseases, milk, foodstuffs, public health and biological products prepared at the Institute. The following are summaries of the special investigations :–

ANTHRAX.—In order to investigate the possible role of imported concentrated foodstuffs for livestock in the spread of anthrax, cultures and animal inoculations were made from numerous samples. Many cultures similar in appearance to anthrax colonies were obtained, but all were non-pathogenic. Two types of bacilli – " pseudo-anthracis " and " anthracoides " – are briefly described.

BOVINE TUBERCULOSIS.—A modification of the Ziehl-Neelsen stain is described. After staining in carbol-fuchsin and washing, the slide is placed in a solution composed of " trypaflavine " 0·2 g., concentrated sulphuric acid 25 c.c. and distilled water 75 c.c., for three to five minutes, and then well washed and blotted. *Mycobact. tuberculosis* appears red in a yellow field which is more translucent than it is after the standard Ziehl-Neelsen method, and the staining mixture can be repeatedly used.

Salmonella pullorum INFECTION.—The cultural characteristics of many strains of *S. pullorum*, isolated from typical cases of bacillary white diarrhoea in Holland,

were examined with reference to reactions on sugars. Most Dutch strains attacked dulcite, whereas all of 20 strains obtained from England did not. The same Dutch strains tested in England behaved as they did in Holland. Further work emphasized the importance of the pathogenicity of strains employed in the preparation of antigen for serological tests and of the need of the laboratory worker for great experience in doing serological tests.

Of 1,923 fertilized hens' eggs examined, 44 contained *S. pullorum*, and the export of chicks from Holland into Belgium was taken under control to prevent the dissemination of *S. pullorum* infection, the Institute carrying out the appropriate technical work in this connection.

Swine Influenza.—An outbreak of respiratory disease with a mortality of 20 to 80 per cent. in young pigs was studied, and from many cases an organism identical with *Haemophilus influenzae* was isolated. Inoculation tests with lung filtrate and culture produced the disease in some cases. It is, therefore, assumed that swine influenza occurs in Holland.

Aujeszky's Disease (Infectious Bulbar Paralysis, Pseudo-Rabies, Mad Itch).—This was diagnosed in three cattle, three pigs, one dog and two cats, all from the same locality in which the disease was observed in 1932.

Fowl Pox.—Reference is made to the need for periodical tests for virulence of strains used in vaccine preparation. According to experience in the field and to a special test made, cocks seem to lose their immunity after vaccination sooner than hens. Vaccination was applied to some groups of one-week-old chicks: they showed no reaction, grew at the normal rate and resisted infection five months after vaccination and again one year later. 2 per cent. sulfoliquid was found to be an effective disinfectant after contact with infective material for two hours.

Fowl Paralysis.—Various experiments were carried out and the results supported the theory that an infective agent is the cause.

No cases of "infectious tracheitis" [virus-caused laryngotracheitis ?] or tuberculosis were diagnosed in poultry during the year.

Milk Hygiene.—A detailed account of a test for the bactericidal efficiency of the Stassano heat treatment of milk is given: the results were favourable. *Mycobact. tuberculosis* and *Br. abortus* were both killed in the process. The Storch test [this *Bull.* **5.** 101.] was strongly positive and the vitamins in milk were only destroyed to a slight degree.

General.—The possible danger to animals of consuming foodstuffs coloured for commercial purposes by dyes was investigated by dosing groups of pigs. A few fowls were also fed with measured amounts, either in grain or water, with or without spirit – the dye being of the fuchsin group. No ill effects were observed.

Ambulatory Section.—Interesting conditions are reported in connection with immunization against blackleg, swine erysipelas in pigs (suspected of being Aujeszky's disease), a paraplegic condition in cattle, diarrhoea in cattle, considered to be due to a bad drinking-water supply, potato poisoning in pigs and equine contagious pustular stomatitis.—J. E.

Germany. (1934). Bericht über das Tierseucheninstitut (früher Veterinärinstitut) der Universität Leipzig für die Jahre 1924-1933. [**Report of the Animal Diseases Institute of Leipzig University, 1924-1933**]. [Eber, A.] pp. 71. [114 refs.] Berlin: Richard Schoetz. [8vo].

This ten-year report is the first to be printed since 1915, since which date the Institute has been incorporated in the veterinary faculty of Leipzig University (in 1923).

The history of the Institute, including its personnel, a summary of the chief

investigations which were carried out, a note on the current work, notes on some causes of death of animals in the zoological garden of Leipzig and a list of published scientific articles are given.

The summary of investigations offers a useful serial abstract of the numerous individual papers and covers the following subjects :– tuberculosis (cross infection between the three types, infection of fowls and hen's eggs and vaccination) ; bovine contagious abortion (vaccination, microscopic diagnosis, milk infection) ; foot and mouth disease (prophylactic chemotherapy) ; Borna disease in horses and sheep ; anaerobic infections of animals ; paratyphoid infection and meat poisoning ; many bacterial diseases of fowls ; fowl paralysis, etc. ; diseases of laboratory animals, " schnüffelkrankheit " of pigs [rhinitis with structural deformity, here stated to be due to *Pseudomonas pyocyanea* infection ; but see this *Bull.* **5.** 233.] ; helminth parasites, and diseases of fur animals.—J. E.

DENMARK. (1934). Aarsberetning fra Veterinaerdirektoratet for aaret 1933. **[Annual Report of the Veterinary Directorate (Denmark) for 1933].** [PETERSEN, G. H.] pp. xvi + 201. 3 figs., 35 tables, 6 graphs, 1 map. [17 refs.] Copenhagen : Kandrup & Wunsch. [8vo].

Denmark was free from any dangerous epizootic during the year. Anthrax was sporadic, and foot and mouth disease, though rather rife early in the year, was quickly put under control, so that only a few cases were observed during the latter half of the year. The slaughter and compensation policy is followed, some Kr. 146,000 being paid to stock-owners.

Foot-rot tends to be troublesome in flocks of sheep. Swine fever, erysipelas and contagious pneumonia caused much loss.

Of 3,464 blood samples sent for diagnosis of brucella infection, 998 were positive, and 1,976 out of 2,314 foetal membranes also gave positive results. Eighty-four cases of tuberculous abortion and 124 of vibrionic abortion were also diagnosed.

About 1,980 cattle were diagnosed as tuberculous and slaughtered, some Kr. 80,000 being paid in compensation. Tuberculin tests were carried out during the year on 256,000 cattle.

Short notes, some statistical, are also given concerning several other diseases, including cases of poisoning diagnosed.

Graphical charts are included to show the census figures for horses, cattle, sheep, goats, swine and fowls from 1880 or earlier up to the present time. Wide variations have taken place over the period [caused chiefly, no doubt, by changes in the volume of the export trade].

The greater part of the report is occupied by copies of orders and circulars in connection with animal husbandry and veterinary affairs.—J. E.

BOOK REVIEWS.

—. (1935). **Black's Veterinary Dictionary.** [Edited by MILLER, W. C., M.R.C.V.S., F.R.S.E., Courtauld Professor of Animal Husbandry in the Royal Veterinary College, London]. pp. xiii + 1141. 326 text figs., 8 plates. London : A. & C. Black, Ltd. [2nd Edit.] [8vo] [21s.]

This second edition has been produced to bring the work more up-to-date since the publication of a first edition in 1928. The text of the previous edition has been reprinted. New matter or re-written text is given as an appendix of 60 pages. Where the original text has been re-written, there is a note in the body

of the text at the appropriate place to this effect, referring the reader to the appendix.

There are some omissions such as swine influenza and anaemia and the expert in a particular field would find it easy to criticise the information offered ; this, of course, is unavoidable, but hardly detracts from the great value of the book as a whole, which fulfils a necessary literary purpose in conformity with the present state of progress in veterinary science. All libraries, institutes or colleges concerned directly or indirectly with veterinary science, and every veterinarian ought to be equipped with a copy.—J. E.

GUNN, E. [A.R.I.B.A. Late Superintending Architect, Ministry of Agriculture and Fisheries]. (1935). **Farm Buildings New and Adapted.** pp. viii + 86. 26 figs., 12 plates. [14 refs.] London : London Caledonian Press Ltd. [8vo] [5s.]

A book for the practical farmer and rural builder, giving advice on space and lay-out to the former and structural details to the latter.

The 11 chapters are devoted to general planning of farm buildings, stables, cow-houses, loose boxes and sheds of all types, piggeries, necessary rooms for dairying, poultry keeping, etc., building materials, ventilation, warmth, lighting, etc. ; electric plants, water supply and drainage and the adaptation of out-of-date buildings for modern use.

As the author points out, there is still much local individuality in the various counties as regards farm buildings and building practice ; he has, therefore, kept chiefly to principles to be followed rather than to dogmatic practical details and has paid no attention to the use of local stone and other materials, but has confined himself in his discourse to materials such as bricks, tiles and that aesthetic abomination – corrugated iron.

There is little to criticise from the view-point of veterinary hygiene, though, in spite of referring to their disadvantages in the text, the drawing for a stable shows a high hay rack and a deep angular wooden manger. The author's choice of flooring also appears curious.

For veterinary surgeons the work can be recommended as a practical concise reference book, useful in giving advice to farmer clients on the improvements to existing buildings.—J. E.

BAYON, H. P. [H. G. Plimmer Fellow in Pathology]. (1934). **Diseases of Poultry : Their Prevention and Treatment.** pp. 216. 63 figs., 2 tables, 1 graph. London : The Feathered World, Ltd. [2nd Edit.] [8vo] [5s.]

The second edition of this work is published within a year of the original publication. It is increased in size and follows much the same lines as the first edition.

The author makes recommendations regarding the prevention of disease and practical methods of disinfection. The practical value of hygiene on the poultry farm is discussed and shown to be of great value.

An index of the more common ailments and morbid conditions of poultry is included, giving symptoms which will lead the owner to suspect the presence of certain diseases.

Under the headings " Head " and " Beak and Mouth " one would wish to see included, in the next edition, Newcastle disease. [In this disease it is usual to find a rattling noise on breathing, and the bird breathing through the mouth and stretching the head].

The publishers' part has again been very well carried out.—NORMAN DOBSON.